Science
Library

41

FEB 10 1939

the OIL AND GAS JOURNAL

FEBRUARY 9
1939

PRICE
O CENTS

AL

the HYDRIL
WAY IS THE
ECONOMICAL WAY

ONE UNIT GIVES YOU TWO TOOL JOINTS

WITH DOUBLE SERVICE LIFE

The Hydril one-piece double-pin tool joint is provided with identical male threads at each end. One thread is made up with the female thread which is cut directly into the upset of the drill pipe; the other is the working thread. The joint is so designed that it never need be welded to the pipe. When, after long service, the male working thread becomes worn, a new working thread is quickly provided without expense by reversing the tool joint. A new female working thread is similarly provided by reversing the lengths of drill pipe.

Contrast this with the conventional tool joint that gives only *one* working thread for each two units.

In addition to the economy they effect, Hydril joints for drill pipe can't creep, won't leak, and handle easiest of ALL drill pipe joints.

Hydril Type "H" Joint — *Hydril Type "EIU" Joint* — *Hydril Type "U" Joint*

HYDRIL COMPANY

General Offices:
714 W. Olympic Blvd., Los Angeles
Cable Address "HYDRIL"

Location of Factories and Shops Where Hydril Equipment is Manufactured: Torrance, Calif.; Houston, Texas; Odessa, Texas; Rochester, Penna.; Avenal, Calif.; Youngstown, Ohio.

Patented

HYDRIL

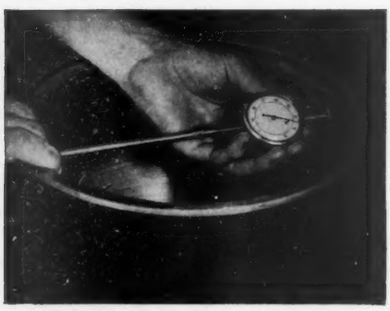
JOINTS FOR DRILL PIPE

Your assurance of quality—

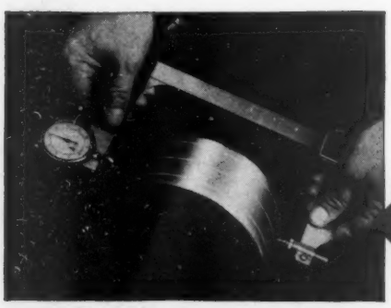
100% INSPECTION

of J & L Seamless A. P. I. Pipe and Couplings!

ACCURATE THREAD CONTOUR comparison is made by means of the Zeiss Thread Comparator, above, which checks thread depth, angle, contour of crest and trough, as well as general thread conditions.



THREAD TAPER of all J & L Seamless Couplings is checked by means of an extremely sensitive indicating gage as shown above.



THREADS on both ends of all J & L Seamless Pipe are checked for taper by means of a precision instrument as shown here.

THREAD LEAD or pitch is examined, as shown above, by means of an accurate instrument which checks the pitch over a distance of one inch and registers variations of one one-thousandth of an inch. An additional check is made by taking a reading of the accumulative pitch.

Now you get even greater safety and service because threads at both ends of every length of pipe and every coupling are checked with jewelers' precision for taper, depth, pitch and size.

Now, even more than ever before, you have the assurance that J & L Seamless Pipe and Couplings are the best that can be made.

As thoroughly as every length of J & L Seamless Pipe has been inspected before in compliance with A. P. I. specifications, today every length is carefully examined at both ends with jewelers' precision to make sure that each thread is 100% accurate.

100% inspection means just this:

First, each length of pipe is inspected for surface defects, wall thickness, trueness to size and straightness.

Next, each threaded end of every pipe and coupling is checked by carefully trained inspectors using the best obtainable precision instruments for accuracy of taper, depth, pitch and size.

Control of thread angle is maintained by the use of a portable Zeiss thread-measuring microscope, while specially developed gages are employed to control alignment of threads on pipe and coupling.

No length of pipe or coupling is permitted to leave the mill unless it has passed 100% these rigid inspections.

The thread accuracy of J & L Pipe and Couplings, assured by this 100% inspection means that every joint can be stabbed—spun down and tonged tight without delay—no galling of threads—no turning of couplings.

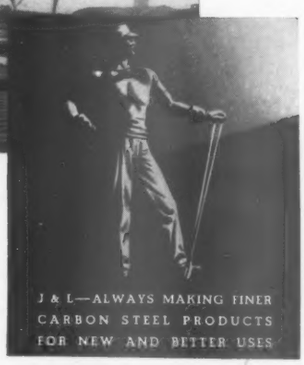
Your drilling time and setting time are cut and each job is completed sooner and at a lower cost. Your entire setting operation is done more economically . . . therefore at a greater profit.

All Jones & Laughlin A. P. I. Oil Country Seamless Tubular Products—Casing—Tubing—Drill Pipe—including the new Integral-Joint Blue Ribbon Drill Pipe are now 100% inspected. Use these products for your next drilling operation and you, too, will say no better threads were ever produced.

Ask your Jones & Laughlin Distributor for full information about 100% Inspected J & L Seamless.

J&L PIPE

Thread accuracy of Jones & Laughlin A. P. I. Oil Country Seamless Pipe and Couplings is assured by 100% Inspection.



J & L—ALWAYS MAKING FINER CARBON STEEL PRODUCTS FOR NEW AND BETTER USES

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS

PITTSBURGH, PENNSYLVANIA

MAKERS OF HIGH QUALITY IRON AND STEEL PRODUCTS SINCE 1850

The Oil and Gas Journal

PUBLISHED WEEKLY BY THE PETROLEUM PUBLISHING COMPANY AT TULSA, OKLAHOMA

P. C. LAUINGER, *President* — *Editor*, C. O. WILLSON

W. T. ANDERSON, *Managing Editor* — JAMES McINTYRE, *Consulting Editor*

W. T. ZIEGENHAIN, *Engineering Editor* — L. G. E. BIGNELL, *Prod. Engineering Editor*

C. K. FRANCIS, Ph.D., *Technical Editor* — W. L. NELSON, *Metallurgical Editor*

Associate Editors

T. F. SMILEY — T. P. SANDERS

DAL DALRYMPLE — PAUL REED

HARRY F. SIMONS

District Editors

Houston, 617 Caroline St.
NEIL WILLIAMS — F. L. SINGLETON

Fort Worth, Petroleum Bldg.
D. H. STORMONT

Shreveport, City Bank Bldg.
GEORGE WEBER

Los Angeles, Union Oil Bldg.
L. P. STOCKMAN

Washington, Natl. Press Bldg.
HENRY D. RALPH

Saginaw, News Bldg.
O. C. PRESSPRICH

Denver, State Office Bldg.
TOLBERT R. INGRAM

New York, 415 Lexington Ave.
H. STANLEY NORMAN

Oil City, Derrick Bldg.
J. P. O'DONNELL

Chatham, Ontario, Box 136
VICTOR LAURISTON

S. H. ROURKE, *Business Manager*

M. F. BALDWIN, *Circulation Manager*

Advertising

E. KLAPPENBACH, *Vice President*

New York, 415 Lexington Ave.
C. L. CAIN

Cleveland, Leader Bldg.
HOWARD MARKT

Chicago, 300 W. Adams St.
C. R. FARMER

Tulsa, 211 S. Cheyenne Ave.
KENNETH J. LANGLEY

Houston, 617 Caroline St.
WAYNE RIVES

Los Angeles, 1406 S. Grand Ave.
J. HOWARD TINKHAM

Cologne, Germany—1 Laudahnstrasse
A. J. CHAMBERS

Table of Contents

Vol. 37, No. 39 — February 9, 1939

News Developments

Summary ... 21

Minnesota Iron Ore Ranges Potential Outlet for Natural Gas ... *Paul Reed* 22

New Fields in South Texas Will Sustain Activity ... *Neil Williams* 24

Sparks From the News ... 26

Amazing Career of Sir Henri Deterding ... 27

Kettleman North Dome Still Most Important Field in California ... *L. P. Stockman* 28

News From State Capitals ... 30

Editorial: Green Light for Gas ... 31

Refinery Runs Too Great, Says Colonel Thompson ... 32

Wage-Hour Rulings on Oil Employes ... *Henry D. Ralph* 33

Junked Car Bodies Protect Pipe Line ... *Harry F. Simons* 35

Obituaries ... 36

International News ... 37

Pipe Line Activity ... 38

Natural Gas News ... 38

Natural Gasoline ... 39

Refinery Expansion ... 39

Programs and Meetings ... 40

Engineering—Operating

Mechanical and Steam Drilling Rigs Used in Zenith, Kans. ... *Harry F. Simons* 42

Operating Ideas ... 45

Chemistry of Lubricating Oils for Use in Aircraft Engines ... *G. M. Larson* 46

Safety—Foot Guard on Rotary Table ... 48

Benefits of Conservation Practices in Conroe, Tex., Oil Field ... *A. S. Parks* 50

Metals Progress ... *W. L. Nelson* 56

Design of a Recently Installed Filtrol Fractionation Plant ... *M. M. Moore and H. M. Gwyn* 59

Technical Control Required in the Manufacturing of Greases ... *W. A. Lutz, H. A. Ambrose, and W. A. Gruse* 62

Questions on Technology ... *C. K. Francis, Ph.D.* 69

Problems From Readers ... *L. G. E. Bignell* 70

Field Operations

Field Operations Summarized ... 73

Illinois-Kentucky-Ohio ... 74

Eastern Fields ... *Staff Correspondent* 76

Southwest Texas ... *F. L. Singleton* 79

California ... *L. P. Stockman* 80

Gulf Coast ... *Neil Williams* 83

Louisiana and Arkansas ... *George Weber* 84

Among Drilling Contractors ... 86

Rocky Mountain Area ... *T. R. Ingram* 88

Oklahoma ... *Dal Dalrymple* 92

Canada ... *Victor Lauriston* 95

Kansas ... *Dal Dalrymple* 96

North and East Texas ... *D. H. Stormont* 99

West and Central Texas and Panhandle ... *D. H. Stormont* 101

Michigan ... *Otto C. Pressprich* 103

Markets and Prices

Group 3 Market ... *T. F. Smiley* 118

A.P.I. Refinery Report ... 119

New York Market ... *H. Stanley Norman* 119

Tank-Wagon Market ... 120

Refinery Prices ... 121

Crude Prices ... 104-122

Additional Features

California Field Summary ... 100-114

Record of Oil Securities ... 115

Personal Paragraphs ... 116

Equipment News ... 123

Classified Advertising ... 126

Advertisers' Index ... 128

Key to Abbreviations ... 107

Wildcats ... 107

SUBSCRIPTIONS: United States, 1 year, $6.00; 6 months, $3.00. Elsewhere, 1 year, $7.00; 6 months, $3.50. SINGLE COPIES: 20 cents each. Back copies, when over a year old, 50 cents. CHANGES OF ADDRESS reaching the Tulsa office of the Journal by Saturday take effect with the following issue

Copyright, 1939, by The Petroleum Publishing Company

SMALL PERCO INSTALLATION SAVES $2000.00 PER YEAR ON CHEMICAL AND LABOR COSTS ALONE

Among the letters received from satisfied PERCO COPPER SWEETENING users is one from Otha H. Grimes, manufacturer of Natural gasolines, advising us concerning the above saving. Mr. Grimes, who installed one of the first PERCO units slightly over two years ago has other complimentary things to say about COPPER SWEETENING.

1. HAS NOT HAD A SINGLE SWEETNESS COMPLAINT.
2. THE PERCO PLANT HAS RUN FOR MORE THAN TWO YEARS WITH NO REPLACEMENT OF THE FILLER—AS OPPOSED TO A THREE DAY RECHARGING SCHEDULE WITH THE OLD FASHIONED METHOD.
3. HAS ENTIRELY ELIMINATED THE HAZARD OF EMPLOYEES HANDLING DANGEROUS CHEMICALS.

DON'T BE SATISFIED WITH AN OLD FASHIONED SWEETENING INSTALLATION. GET COMPLETE DETAILS ABOUT PERCO COPPER SWEETENING —WRITE

PERCO INCORPORATED

PERCO

Bartlesville, Oklahoma

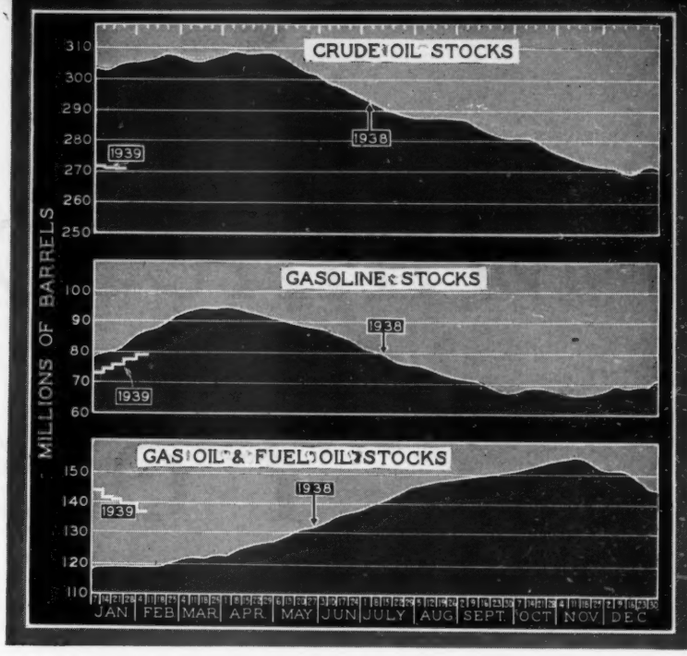
Or consult your Licensing Representatives

L. S. GREGORY COMPANY
TULSA, OKLAHOMA

PROCESS MANAGEMENT COMPANY
120 East 41st St., NEW YORK, N. Y.

Trends

Consumption of Petroleum Products Rising, But Runs to Stills Cause Uneasiness


CRUDE OIL STOCKS
GASOLINE STOCKS
GAS OIL & FUEL OIL STOCKS
MILLIONS OF BARRELS
1938
1939
JAN FEB MAR APR MAY JUN JULY AUG SEPT OCT NOV DEC

REPORTS from several sources indicate that predictions made a few weeks ago in regard to probable gains in consumption of petroleum products this year over 1938 are being sustained by developments. While the final figures on January demand will not be available until the Bureau of Mines report is released next month, the weekly data covering the production and stocks of crude oil and refinery products and the statements of individual companies lead to the conclusion that the demand is running ahead of last year.

CRUDE PRODUCTION *3,436,154 barrels daily average—up 184,375. One year ago 3,313,376 barrels.*

CRUDE STOCKS *271,110,000 barrels as of January 21—down 709,000. One year ago 304,424,000 barrels.*

GASOLINE STOCKS *79,149,000 barrels as of February 4—up 1,870,000. One year ago 86,788,000 barrels.*

GAS AND FUEL OIL STOCKS *137,589,000 barrels as of February 4—down 1,760,000. One year ago 120,575,000 barrels.*

REFINERY RUNS *3,140,000 barrels daily week ending February 4—down 95,000. One year ago 3,149,000 barrels.*

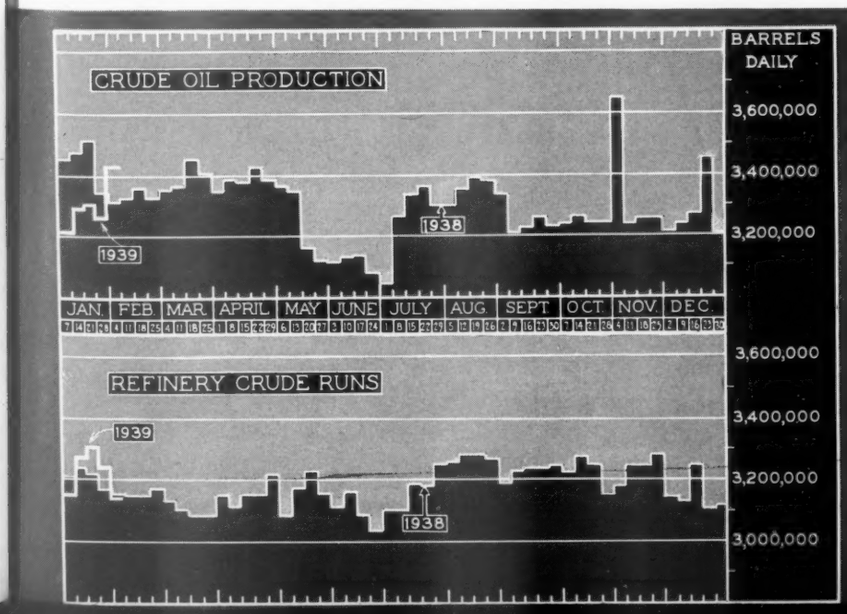
Crude runs to stills in January, according to the A.P.I. weekly reports, were about 3 per cent greater than in January last year. In January, 1938, gasoline production exceeded shipments by approximately 9,000,000 bbls., compared with 5,500,000 bbls. in January this year, the weekly A.P.I. reports show. These comparative data indicate that total gasoline shipments last month may have been as much as 4 per cent higher than in January last year.

The comparative figures covering fuel oil, gas oil and distillate are even more impressive. With a greater production than last year, stocks of these products were reduced about 6,000,000 bbls. in January this year, a situation which contrasts with the 2,500,000-bbl. gain in January, 1938. The reports on crude oil shipments are not as conclusive as those covering refinery operations as no final stock figure for the end of January is available. The latest information points to a reduction in crude stocks of at least 130,000 bbls. daily in January this year which compares with additions to stocks of refinable crude averaging 20,000 bbls. daily in January, 1938. With domestic production running behind last year these figures indicate that the actual demand was about the same for the two months under comparison.

The large increase in crude oil production last week was due entirely to the lifting of the Sunday shutdown for one week in Texas. This situation will not be duplicated this week, which should mean that the daily output will be about the average for January. Aside from the large gain in output, the fact that Illinois production jumped 11,588 bbls. daily to a new high for its entire history was the principal development of the week.

Notwithstanding weakness which developed in certain sections of the refinery market, its general trend was toward increased firmness. Natural gasoline resumed its seasonal decline, but if export inquiries in hand are turned into contracts unwieldy stocks now causing trouble are likely to be removed. Heating oils showed moderate improvement in the Mid-Continent and East.

Additional statements issued the past week stressed the need of reductions in crude runs to stills over the next 60 days as a basis for a recovery in refinery markets later in the year.



DAILY AVERAGE PRODUCTION FOR WEEK

	Feb. 4, 1939	Bur. Mines Feb. est. of demand	Feb. state allowables	Jan. 28, 1939
Oklahoma City	90,925	.....	.....	99,875
Fitts	32,775	.....	.....	32,550
Remainder of state	298,300	.....	.....	298,450
Total Oklahoma	422,000	482,500	428,000	430,875
East Texas	447,146	.....	.....	372,498
West Texas	239,800	.....	.....	205,896
North Central Texas	119,548	.....	.....	109,047
Texas Panhandle	65,897	.....	.....	64,500
East Central Texas	101,700	.....	.....	91,600
Gulf Coast Texas	396,250	.....	.....	342,549
Southwest Texas	125,596	.....	.....	105,100
Total Texas	1,495,937	1,297,500	1,319,542	1,290,590
North Louisiana	69,385	.....	.....	71,890
Gulf Coast Louisiana	191,650	.....	.....	190,800
Total Louisiana	261,035	246,800	255,140	262,690
California	605,750	580,000	600,000	623,250
Kansas	140,125	148,600	153,900	148,575
Arkansas	52,360	48,200	.....	51,850
Eastern fields	92,750	94,300	.....	92,300
Illinois	146,110	102,500	.....	134,522
Michigan	51,657	47,200	.....	50,147
New Mexico	102,450	99,600	99,600	100,720
Rocky Mountain area	65,980	72,800	.....	66,260
Total United States	3,436,154	3,220,000	.....	3,251,779

Minnesota Iron Ore
Potential Outlet

By PAUL REED

A major natural gas pipe line will be in process of construction within a short time if two commissions of the federal Government take favorable action on matters which are now pending. There is reason to believe that decisions may be reached soon. In this event a pipe-line building program will get under way this spring which will be of greater magnitude than any undertaking the industry has seen since 1930.

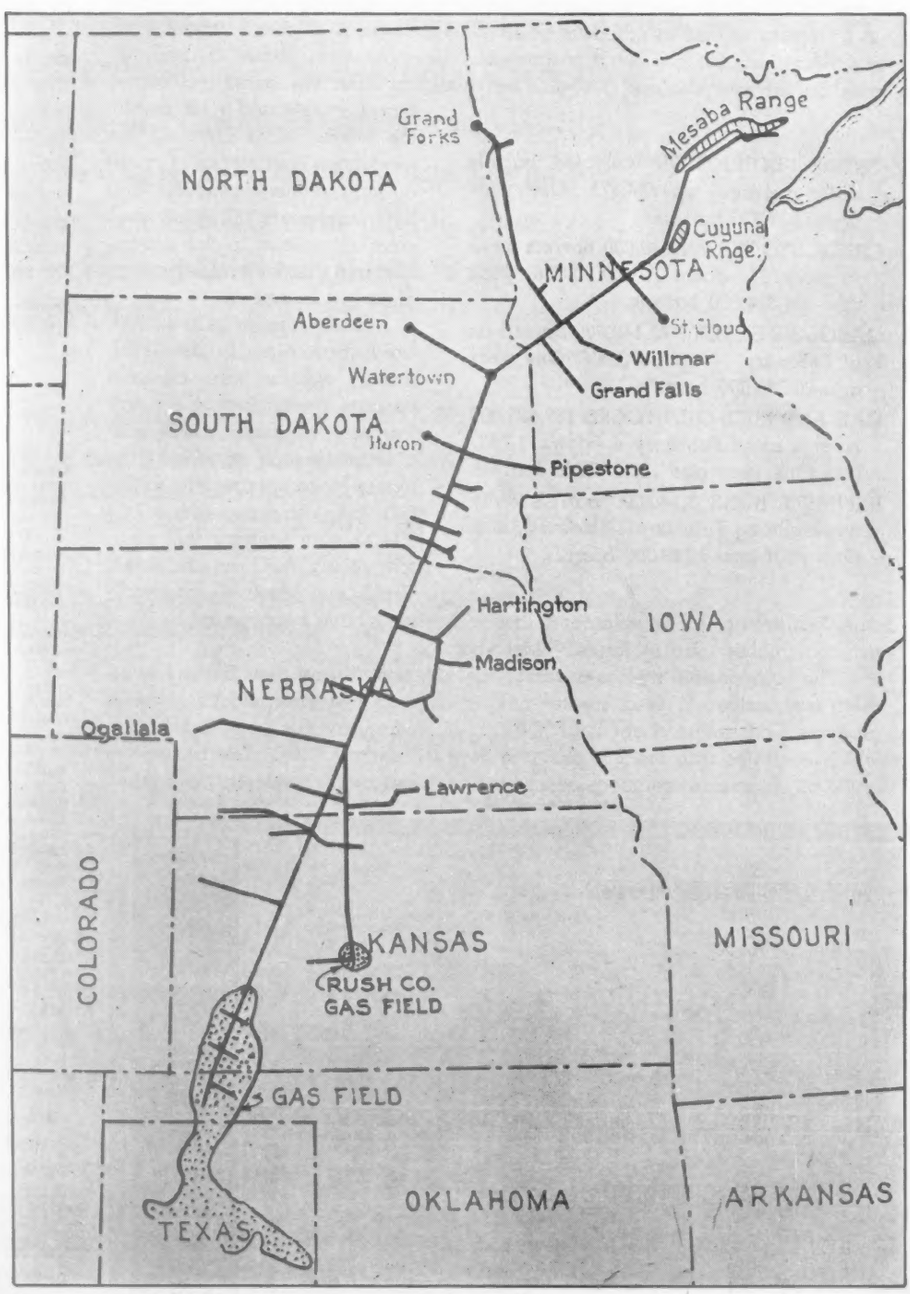
The project has been planned by the Kansas Pipe Line & Gas Co. for the purpose of transporting gas from the Hugoton gas field of southwestern Kansas and the Oklahoma Panhandle to Minnesota. The total original cost of the line is estimated at $20,370,000. The main line of 1,040 miles will cost about $12,675,680; 1,306 miles of tap line will cost $3,480,000; six compressor stations $2,300,000. Within three years after completion it is estimated that an additional $1,100,000 will be spent for increasing compressor station capacity.

Of special significance is the fact that one of the principal objectives of the proposed line is to make natural gas available for concentrate operations in the iron range country of Minnesota. A supply of natural gas will make it possible to utilize low grade ores which cannot be handled profitably when other fuels are used. However, the distribution of gas to communities in the vicinity of areas traversed by the pipe line in Kansas, Nebraska, South Dakota, North Dakota, and Minnesota will comprise the largest part of the business of the proposed line.

Financial Aspects

Probable gas sales for industrial purposes in the iron range will be less than 25 per cent of the total volume; still they are the most interesting aspect of this project which will link a large gas reserve of the Southwest with the "beneficiation" of undeveloped low grade ore deposits, which will mean the constructive utilization of natural resources on a large scale which will represent an important step in the industrial progress of this country.

The substantial nature of the project is indicated by the fact that it is the outcome of efforts made by leaders in the gas pipe line and iron ore mining industries who are directly in charge of this undertaking in which they will have considerable personal investments. In no sense is this a promotional enterprise; financing will not be done by stocks offered to the public. L. E. Fischer of Chicago is president, chief executive and largest individual stockholder of the Kansas Pipe Line & Gas Co. He was formerly president of Northern Natural Gas Co. during the period of construction and development of that company's natural gas pipe line system. He was also in charge of operating the extensive public utility properties of the North American Light & Power Co. The present system of Kansas Pipe Line & Gas Co. was built three years ago to supply gas from the Otis gas field to towns in Northwest Kansas and Southwest Nebraska. About 600 miles of pipe line have been built connecting 45 towns; assets of the



Kansas-Mesaba natural gas pipe line

Ranges for Gas

company are valued at $5,000,000. The second largest stockholder, Emmett Butler, St. Paul, Minn., is a member of the firm of Butler Bros. which is a major concern having 5 per cent of the ore mining operations in the Minnesota iron range. He is a brother of Pierce Butler, justice of the U. S. Supreme Court.

In the spring of 1938, Harza Engineering Co., Chicago, made a survey on which preliminary plans for the proposed system have been based. As soon as it is possible to complete arrangements in Washington steps will be taken to buy right of way; contracts will be let, and orders will be placed for pipe and equipment.

From the standpoint of load factor, the outlet to the Mesaba range is attractive since operations there are concentrated into the summer months as movements of ore on the Great Lakes are discontinued during winter because of ice.

Gas Supply

Provision for a gas supply has been made through an agreement with Hagy, Harrington & Marsh, Amarillo, Tex., by which they agree to supply all of the gas requirements of the new system and for this purpose they dedicate 160,000 acres held by them in the Hugoton gas field. The development program of Hagy, Harrington & Marsh calls for the drilling of 40 wells during 1939 and 1940 at a cost of $30,000 per connected well, making a total of $1,200,000. In succeeding years it is expected that 10 wells a year will be drilled. Hagy, Harrington & Marsh are the largest owners of gas leases in the Hugoton area. Other large owners are: Panhandle Eastern Pipe Line Co.; 158,000 acres; Cities Service Co., 154,000 acres; Magnolia Petroleum Co., 114,000 acres; Republic Natural Gas Co., 108,000 acres; Columbian Fuel Co., 79,000 acres; Northern Natural Gas Co., 65,000 acres; Peerless Oil & Gas Co., 62,000 acres.

The gathering system will be built of pipe in sizes ranging from 4-inch to 16-inch, averaging 2 miles per well. Furthermore, Hagy, Harrington & Marsh will build a modern absorption plant for recovery of natural gasoline costing $200,000 near the first compressor plant of Kansas Pipe Line & Gas Co. At the present time Hagy, Harrington & Marsh are selling 35,000,000 cu. ft. of gas per day to Northern Natural Gas Co. from properties in the Texas Panhandle. This gas is delivered through Cargray Corp. gasoline plant to the Northern station near Skellytown.

According to estimates made by geologists and engineers it is expected the Hugoton field will produce 8,000,000 cu. ft. per acre from an area of 2,250,000 acres which means a total reserve of 18,000,000,000,000 cu. ft. Up to January 1, 1938, the total withdrawals from the field have been 124,000,000,000 cu. ft., which is less than 1 per cent of the estimated total reserve. On the basis of estimated recovery, the acreage dedicated to the project by Hagy, Harrington & Marsh would be sufficient to supply the pipe line with 100,000,000 cu. ft. per day for 35 years. Development plans call for deliveries to the trunk line of 40,000,000 cu. ft. per day the first year with increases every year which will bring deliveries up to 60,000,000 cu. ft. daily the fifth year.

The preliminary negotiations for the Kansas Pipe Line & Gas Co. line to the iron country have already had the result of acquainting the gas industry with the meaning of the mining term "beneficiation" which is applied to a process of rough separation of ore from limestone for the purpose of making shipments in the form of concentrate at considerable saving in freight.

Before discussing beneficiation further, particularly in regard to the future relationship it may have with the natural gas industry, certain facts should be reviewed concerning the size and scope of Minnesota iron range operations. More than three quarters of the iron ore produced in the United States comes from this area. About 90 per cent comes from Mesaba range; 10 per cent comes from Cuyuna range. Practically all of the major steel companies in the country operate in this area either directly or through subsidiaries.

Reserves of ore at the Mesaba range have been classified as follows: Class I ore is shipped in the form in which it is mined; Class II and III are shipped as concentrate. Of the original Class I ore deposits, nearly a half has been exhausted; estimated reserves are 1,100,000,000 tons. Class II ore deposits have been depleted only a fraction. Class III deposits have been exploited only to a limited extent. Expressed in terms of concentrate, reserves of Class II ores are 1,300,000,000 tons. Reserves of Class III are 57,200,000,000 tons.

Among large steel companies reserves of Class I ores are distributed unevenly. Some companies have 50 years' supply while others have less than five years. This situation, together with certain other considerations affecting steel companies' ore reserve policies, appears to lead inevitably to an increasing use of the lower grade ores which will require enlargment of facilities for preparing this ore for shipment in the form of concentrate.

The jig process of beneficiation is a method by which a water table is agitated to reject the lighter ore. At present 100,000,000 tons of waste ore are piled up which can be reworked by the magnetic process when cheap natural gas can be made available. This process requires 750 cu. ft. of gas to treat a ton of ore. Processing the rejected waste ore, now available, would require 75,000,000,000 cu. ft. of gas. Extensive construction of concentration plants for this work would, of course, create extensive employment.

In designing the proposed line, it is contemplated that 62.50 pound, 16-inch O. D. pipe with .375-inch wall thickness will be used for the main line. This is pipe of smaller diameter than that used on other major projects. Plans call for operating the pipe line at 700 pounds pressure. Compressor equipment is to be added as needed. Pressure at the wells in the Hugoton field will start off at 400 pounds. Six compressor stations are to be built with a total of 23,000 horsepower.

Federal Commissions

Application has been made to the R.F.C. for a $20,000,000 loan to be secured by present assets of the company and the proposed line which will provide assets valued at $26,000,000 to secure a $20,000,000 loan. The loan is to be repaid over a period of 20 years.

Before the R.F.C. can pass on this application a decision must be handed down by the F.P.C. which has the matter under consideration. Objections have been raised by certain companies with smaller reserves, some of which are located further from the territory to be served by the Kansas Pipe Line & Gas Co. project than those of Hagy, Harrington & Marsh. Other objections have been raised by competitive coal interests which are attempts to dictate the type of fuel to be used in the Nebraska, South Dakota, North Dakota and Minnesota areas to be traversed by the proposed line. Issues involved were discussed in The Oil and Gas Journal, January 26 issue, page 63.

The applicant company has been represented at the hearings in Washington by John P. Devaney of Minneapolis, a former chief justice of the Minnesota Supreme Court, and by Allen V. Junkin, of St. Paul. Decision regarding jurisdiction over the proposed new line by the Federal Power Commission is expected shortly.

Large compressor station on trunk line between the Panhandle and northern states

New Fields in South Texas Will Sustain Activity

By NEIL WILLIAMS

CORPUS CHRISTI, Tex., Feb. 6. A definite upturn in oil activity is manifest over South Texas, particularly the coastal section. Not only are exploration and drilling increasing but also a general expansion of other phases of operation, including building of gasoline extraction plants, installation of gas-recycling and repressuring projects, additions to refining facilities, and extensions of pipe lines. More new work is being projected than at any time in several months.

Special significance is attached to the projects for recycling and repressuring, an operation which has been receiving growing attention on the part of South Texas operators in view of the number of gas and distillate producing fields being opened. Within the past month large-scale recycling projects have been completed and placed in operation in two different fields, while in more than a half dozen other fields installations are being started or are proposed. Recycling now looms as a major development in South Texas operations.

Discoveries Inspire New Drilling

Recent wildcat discoveries and field extensions are providing incentive for more intensive exploration and continued drilling. More than 35 new fields were found the past year and this year has started with an additional discovery, as well as proving oil production in a second new field in which the discovery well, completed late the past year, was a gasser. The new field, near La Gloria, southern Jim Wells County, was opened the past week by Shell Petroleum Corp. No. 1 Blucher, a distillate well completed in the Frio-Vicksburg section at 7,505-60 feet. At Riverside, Nueces County, first oil production has been found this year by Seaboard Oil Co. No. 2 Wilson, completed by perforating at 4,994-97½ feet. It is 4,000 feet west of the discovery gas well. Already five operations have been started in this area, and showings encountered in a number of wildcats point to the opening of additional fields.

Excluding the Balcones Fault line, nearly 200 drilling rigs are running in South Texas. Although this is still below the peak for the past year reached last summer, drilling again is increasing, with indications that during the next several months the number of active operations will soar to new levels. Already this year more than 175 new operations have been reported, which, as compared with the approximate 100 wells completed or abandoned, represents a decided net upturn.

The coastal region, taking in a strip of counties from Victoria on the north to the Rio Grande Valley on the south, and particularly the immediate Corpus Christi area, is figuring largely in this activity. There are nearly 100 rigs running within a 50-mile radius of Corpus Christi. Taking in another 25 miles, at least 50 more active operations can be added. Proposed field development and wildcat projects due to get under way are expected to boost the number of rigs materially.

Except for the McCampbell field, Aransas County, where active operations recently have risen to 19, and South Alice with 9 to 10 rigs running, there are no sizable local concentrations of drilling. The drilling is spread over a number of different fields and areas, in which steady development programs are being carried on. Only in a few fields and areas are more than two or three rigs kept running, and in most instances development is restricted to one rig. This leaves the way open for extensive potential development.

More Than 140 Pools

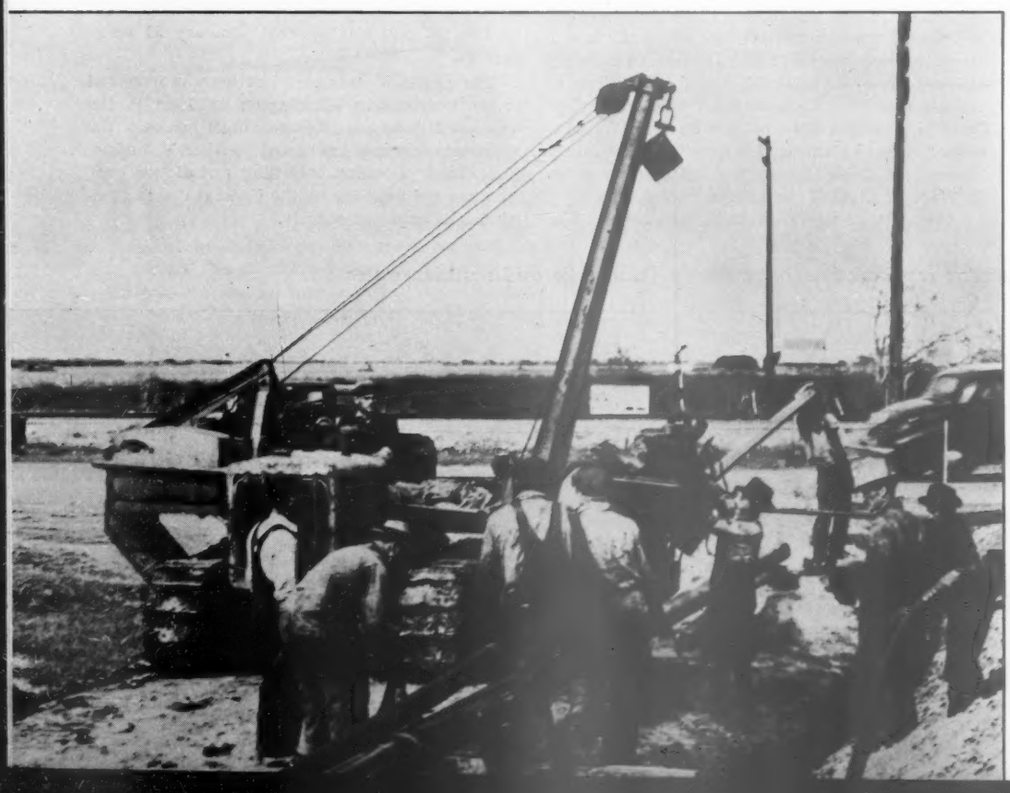
Discoveries the past year have increased the total of fields in South Texas (exclusive of the fault line) to more than 140, about equally divided between the coastal region and the Laredo-Government Wells trend. Most of these fields, particularly in the coastal district, have had only limited development, which, in view of undefined producing areas and unexploited additional potentially productive sands, together with extensive remaining wildcat potentialities, assures the district, as a whole, of continued drilling.

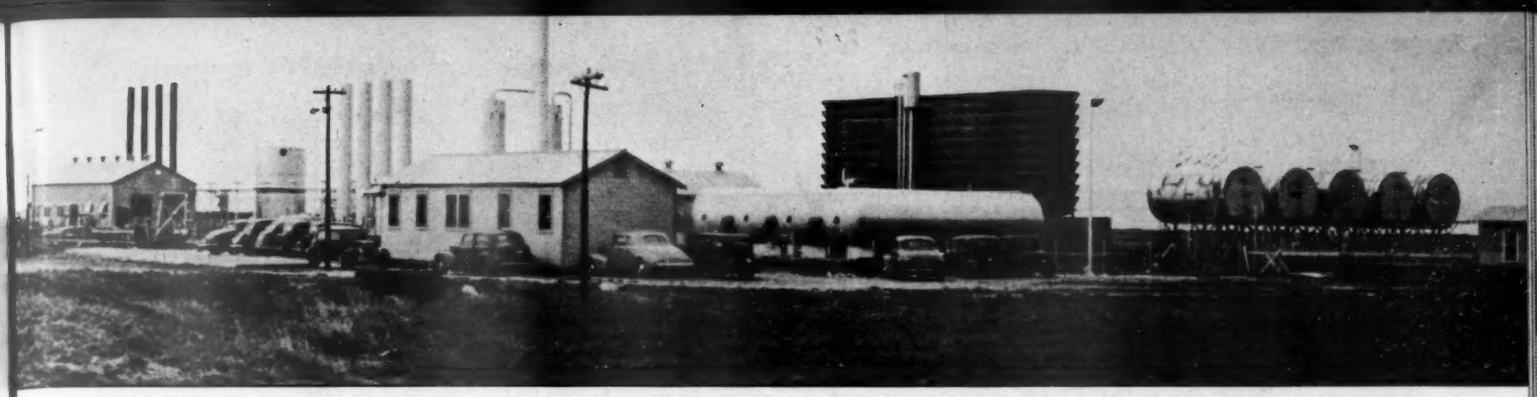
Extension of production to the townsite of Aransas Pass is the occasion for the intensive drilling play getting under way in the McCampbell field. With 19 rigs running, the number of active operations rapidly is being increased. Excessive drilling in the townsite is being prevented, however, by restriction to one well to each four blocks. Permits for wells have been taken out for most of the townsite, and as there is no indication of production playing out as yet, it is probable the entire townsite will come within the field's ultimate limits. With a productive area already proved, the field rapidly is becoming one of the largest in South Texas.

Second to McCampbell in concentration of drilling is the South Alice field in Jim Wells County, where 9 to 10 rigs have been kept running since the discovery less than a year ago. Drilling is being spread over a fairly wide extent with constant extension of the producing area. Outside the South Alice field, there is no slackening of the widespread wildcatting play. This county, and Nueces County to the east, have been among the most actively wildcatted counties in the district. Within the past year, indications have been given of several new fields, and the showings and discoveries have given incentive for more intensive exploitation.

Following the "trend," on which the South Alice field and Jim Wells County are located, the play in exploration and development of Frio and Vicksburg potentialities is gaining momentum. This "trend" which extends along a strip 30 to 40 miles wide through the coastal region from

One of new pipe line jobs being laid into Corpus Christi. Laying line into General American terminal





Recently completed gasoline plant of Henderson Co. in Agua Dulce field, Nueces County

Victoria County on the north to the Rio Grande border, much almost virgin country, offers prospects for some of the district's most important fields.

Major Extent

This trend contributed a substantial number of discoveries the past year, among which, besides South Alice, were the Kelsey field, in southeastern Jim Hogg and southwestern Brooks counties, and the Sun field, in northern Starr County. These fields, opened almost simultaneously last September, have given indications of being of major extent, with the possibility they may be linked forming a single field although the discovery wells were more than 12 miles apart. Since their discovery, three wells have been completed in the Kelsey field and five in the Sun field. Three rigs are running in each field but this is expected to be increased. Acreage in both fields being in controlled hands has prevented launching of drilling booms.

Contributing to the general activity are the La Rosa field, in Refugio County, and the Fitzsimmons field, Duval County. Both are discoveries of the past year, the former being on the "Frio-Vicksburg" trend and the latter on the Pettus-Cockfield trend, which parallels the former trend on the west. Opened last July, La Rosa now has 17 wells, while Fitzsimmons, a May discovery, has 45 wells. In each six rigs are kept running.

Important expansion of natural gasoline plant and gas recycling and repressuring work also is under way. Two new recycling projects have been placed in operation the past month, one by Corpus Christi Corp. in the Stratton field, Nueces County, and the other by Henderson Co. in the Agua Dulce field, same county. In the Stratton operation 60,000,000 cu. ft. of gas is being cycled daily, being taken from a special high-pressure separator at a pressure of 1,200 pounds and boosted to a pressure of 3,000 pounds for injection into the sand. Four 600-hp. compressors have been provided.

Approximately 60,000,000 cu. ft. of gas is being cycled in the Henderson Co. operation at Agua Dulce. Here the gas is processed through a gasoline extraction plant which has been built in connection with the recycling installation.

Another recycling project has been in operation in the Agua Dulce field, installed about a year ago by Process Oil Co. This installation is cycling about 8,000,000 cu. ft. of gas daily. United Gas Pipe Line Co. also has been operating an absorption gasoline plant in the Agua Dulce field for several years but until the past year no attempts had been made to repressure.

Stanolind Oil & Gas Co. and Seaboard Oil Corp. have started construction of a gasoline plant and recycling project in the Luby field, southern Nueces County, the first in that field. These operators have been carrying on a consistent development program and have proved a productive area of fairly large extent with more than 100 wells completed.

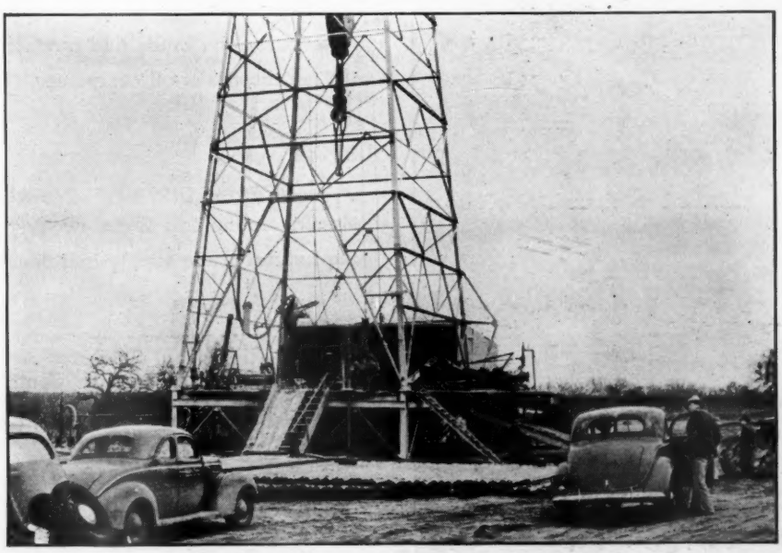
In the new San Salvador field, west of Edinburg, Hidalgo County, in the Rio Grande Valley, Pan American Production Corp. is considering installation of a gasoline plant and recycling project. In this field, which is on the new Frio-Vicksburg trend play, Pan American has recently contracted with Loffland Brothers for drilling eight wells. So far the discovery, completed as a distillate producer, is the only well.

Temple Hargroves and H. C. Cockburn, of Houston, have obtained a "farm-out" from Shell Petroleum Corp. in the La Sal Viejo field, near Raymondsville, Willacy County, in the extreme south end of the coastal region, and is preparing to resume operations. This field, in which only the discovery well, a distillate producer, has been completed, has been inactive. A development program is being planned, including the construction of a gasoline plant and facilities for recycling the residue gas to the sand.

Will Take in Townsite

Burton E. McCollum, who controls substantial interests in the new McAllen field, also has under consideration a gas recycling plant on the R. E. Harding property. Two gas-distillate wells have been completed in this field with indications development will take in the townsite. This is expected to start another drilling play.

Recycling and repressuring operations are being undertaken in the La Blanca field, also in Hidalgo County. The operators will take the gas from high-pressure sands, and inject it directly into the low-pressure sands.



Seaboard Oil Co. No. 2 Wilson, coming in as discovery oil well of new Riverside field, Nueces County

The first gasoline plant in the South Alice field, Jim Wells County, also is proposed. This will be built by Tom Graham, one of the principal independent operators.

Recycling and Repressuring

Adoption of recycling and repressuring as a production practice is a comparatively recent development in South Texas. In view of the increasing number of fields with high gas-oil ratio production, it is expected the practice will spread to become a major phase of operation. With greater application of recycling, increased incentive is expected for development of the gas-distillate and high gas-oil ratio types of fields. Development of such fields has been handicapped by restrictions imposed on fluid recovery due to high gas-oil ratios. By conservation of the gas returned to the producing sand, wells may be produced at rates high enough to obtain more favorable fluid recovery.

Adding to the general activity in South Texas, Col-Tex Refining Co. (Anderson-Prichard Corp., Oklahoma City) is completing a new asphalt blending plant at Corpus Christi. Adequate contracts for asphalt and road oil have been obtained.

The general development is being reflected in new pipe line work. Corpus Christi Corp., operator of the recycling plant in the Stratton field, is laying a 4½-inch gasoline line from that field to tidewater at Corpus Christi, 25 miles. The line will have a capacity of 1,200 bbls. daily.

Humble Pipe Line Co. is laying a welded 8-inch line from its new Kelsey field, southwestern Jim Hogg County, to Benavides, Duval County, where the line connects with the company's main Southwest Texas system.

Reco Pipe Line Co. (Reed & Cox) is reported considering laying 9 miles of line from the Clara Driscoll field to Corpus Christi.

Amsco Pipe Line Co. is considering doubling the capacity of its facilities from the Luby field to Corpus Christi. This company now has a 4-inch line but expects either to loop this line or replace it with a 6-inch or 8-inch line.

Due to proration restrictions, the active development in the district is not reflected in production figures. Although between 35 and 40 new fields, several proved of major extent, were opened the past year, and important extensions made in others, crude output is slightly less than a year ago, running about 210,000 bbls. daily. Of this, approximately 130,000 bbls. daily is in the coastal region, and 80,000 bbls. in the Laredo-Government Wells district.

The potential production of the district is greatly in excess of the allowable, but curtailment keeps a valuable commodity in the ground until it needed in the distant future.

SPARKS FROM THE NEWS

WORLD-WIDE ACCOMPLISHMENT

Expanding a few small companies to more than 200 world-wide units, with assets exceeding one billion dollars, summarizes the accomplishments of Royal Dutch-Shell's Sir Henri Deterding who died Saturday in Switzerland.

TWO HIGHS

High water and unfavorable weather did not stop Illinois from producing 146,110 bbls. daily last week, the highest mark in its history.

COMPETITOR COMPLAINS

Producers, consumers and many industries would benefit from the proposed major natural gas system north from Kansas. The only complaint comes from those who insist consumers should be compelled to burn coal.

EN ROUTE

A new plant in Agua Dulce field, Nueces County, Texas, is recycling 60,000,000 cu. ft. of gas daily in and out of the producing horizon and removing the natural gasoline en route.

Night drilling in Evangeline town lot, Louisiana

COMPENSATION

Snowstorms over wide areas in the past week kept cars in the garage, but infused a little life into the heating oil market.

OKLAHOMA CAMPAIGN

Western Oklahoma's 1939 wildcat campaign is off to a good start, with new tests in virgin areas being drilled in four counties and others planned for several counties in the Anadarko basin.

FLY IN OINTMENT

"There is one very bad fly in the ointment," says Colonel E. O. Thompson, "and that is crude runs to stills have been exceedingly high of late."

DRILLING STARTS

Drilling is now under way in the Forest City basin, with two tests started on the Kansas side of the four-state play.

APPLIED CONSERVATION

One well in Kettleman Hills has produced 6,000,000 bbls. of crude, sufficient to fill a tank 39 feet high covering the 20 acres on which it was drilled.

REFLECTION

Annual statements now appearing show that last year's lower prices for crude and products were reflected directly in the net income of oil companies.

PROOF

Last week's production gain of 184,377 bbls. daily emphasizes again the part Texas' two-day shutdown plays in balancing natural crude supply and demand.

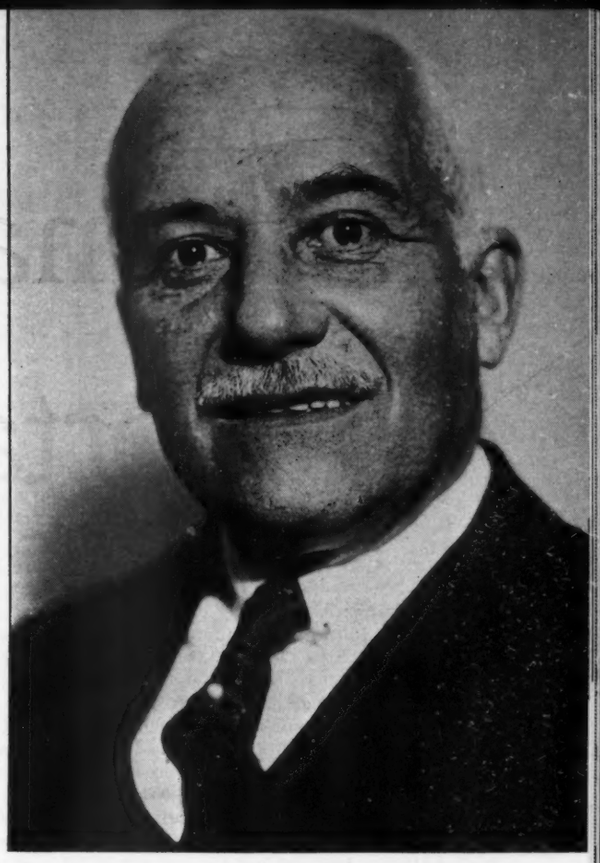
SOUTH TEXAS ACTIVITY

With 200 rigs running, South Texas is maintaining its position as one of the most active drilling areas.

HISTORY REPEATS

Inability to dispose of all crude in some areas regardless of price and rapidly declining output in others are bringing new support for a conservation law in Illinois.

AMAZING CAREER OF SIR HENRI DETERDING



"An International Oil Man" was Sir Henri's proudest title

Sir Henri Deterding died suddenly at St. Moritz, Switzerland, Saturday, February 4. A doctor had been summoned owing to what was thought to be a slight indisposition but Sir Henri laughingly remarked: "There is nothing much the matter with me."

The physician was just leaving the villa when he was recalled, but the famous oil man had expired from a heart seizure.

The body was taken back to his estate at Dobbin, Mecklenberg, Germany, for burial.

Humble Beginning

Sir Henri Wilhelm August Deterding was born in Amsterdam on April 19, 1866, a son of Jakob Philip Deterding, a master mariner.

He was 16 when he became a clerk and youngest employe of the Twentsche Bank on July 1, 1882. Young Deterding earned something like $1.20 a week.

"Paid monthly," he wrote in his autobiography, "An International Oilman," "it seemed quite a lot. Drudgery? There was plenty of it. What would the bank clerk of today say to working as I and my fellow-clerks did so often until midnight and even later?" And there was no overtime pay.

Young Deterding decided, like many other young men, to seek his fortune in the colonies and went out to the East Indies in the employ of the Netherlands Trading Society. On arrival at Medan he was assigned to the bookkeeping at Deli, a remote branch. He found a set of books so hopelessly muddled he was puzzled where to begin. Every balance was incorrect.

The young bookkeeper took long walks to cudgel his wits. Eventually he checked back every single entry and installed a new set of books. It took him four months, and his salary was increased by 75 per cent.

"A ridiculously simple solution," wrote Sir Henri, "perhaps. But the wise man never lets go of a problem which it is his duty to solve until he has analyzed it through and through, and knows in his heart that it cannot be solved. Then, if he can't cut the dead wood away from it, he cuts the whole thing forever clean out of his life.

"Had I let that tough bookkeeping job at Deli master me, instead of my mastering it, my whole life would have been different. A minor bookkeeper I was then, and a minor bookkeeper I should probably still be if I had not grappled with and finally throttled that hydra-headed monster in the shape of the jumbled, confused mass of figures I had then to unravel. The supreme advantage to me of unravelling those figures was that it gave me the unravelling habit. . . . In the time of perplexity there is nothing like dragging worries into the daylight. Only bring the sun of simplicity to shine on your troubles and they soon melt away. . . . Only a small man has time to be complex."

After Deli, he was appointed agent at Medan, and later at Penang, where he went to J. B. A. Kessler, managing director of the Royal Dutch Oil Co.; he reminded Kessler of an offer of employment made several times, and was engaged.

Mr. Deterding joined the Royal Dutch Co. for the Working of Petroleum Wells in the Netherlands East Indies on May 15, 1896. The company had been founded in 1890 with a capital of about $500,000. Young Deterding proceeded to Pankelan Brandon, where a pipe line had been laid through the jungle to northern Sumatra.

At that time the oil produced contained from 48 to 50 per cent of kerosene. This, alone, was salable. The remainder was then treated as waste!

The beginnings were difficult. Price-cutting was prevalent, and Sir Henri, in his memoirs, described this as follows:

"You may call it a refined form of throat-cutting, a stranglehold, a dog fight or by any more appropriate or opprobrious name you like, but competition is most certainly not the name to give to trade rivalry so misguided that a trader's only chance of survival—and a very remote chance—depends on just how low he can cut prices. You cannot compete with a man, nor he with you, if all the while you are both bent on squeezing each other to death."

One Advantage

Mr. Deterding's one advantage lay in the fact that his oil was shipped from relatively near-by East Indies, whereas the Standard exported from Pennsylvania. The Standard, however, possessed remarkable transportation facilities, a consideration which subsequently led to Mr. Deterding's amalgamation with the Shell Transport Trading Co. of Great Britain, which had sent the first oil tanker through the Suez Canal. The new combination set forth on a campaign which, thanks to Mr. Deterding's organizing and promoting ability, ended in the oil conquest of a fair sized slice of the globe.

The Shell organization was, by the way, the creation of Marcus Samuel, later Lord Bearsted, who began his career in a dingy shop in Houndsditch, London. One day, the story goes, his children brought home their empty lunch boxes decorated with shells they had picked up on the beach. Mr. Samuel thought shell-covered souvenir boxes from various resorts might be a clever sales item. The idea developed into M. Samuel & Co., conchologists extraordinary, who handled items adorned with shells from all parts of the world. From this giant "shell game" Mr. Samuel eventually branched into oil in the Far East, which accounts for the word "Shell" of Royal Dutch-Shell.

Mr. Deterding was responsible for the installation of huge storage tanks at Shanghai, Hongkong, Calcutta, Madras, Bombay, and Bangkok for facilitation of delivery.

The famous merger took place in 1906 and, under the directorship of Mr. Deterding, with his plunging, absorbing, and promoting tactics, the company rose from a small producing concern in the Dutch East Indies to a position of strategic importance.

When Mr. Kessler died in 1900, Mr. Deterding became managing director of Royal Dutch. In 1903 occurred the merger between Royal Dutch, the Paris Rothschild Russian oil fields and the British Shell company. From that combine sprang the Asiatic Petroleum Co.

There was determined opposition by the United States interests.

"Prices," wrote Sir Henri, "shot up and down unceasingly and about as senselessly as a monkey on a stick. There was waste of duplication and the folly of fluctuating prices."

The war became so ruinous that pourparlers were started. Mr. Deterding met Walter C. Teagle of the Standard Oil Co., and the two became firm friends. The "throat-cutting" was stopped in 1907, but broke out with renewed vigor in 1910.

"I can imagine no more effective way of wrecking an industry," wrote Sir Henri, "than to get it embroiled in a rate war."

The ramifications of the Royal Dutch spread eventually through Rumania, Russia, Egypt, the United States, Mexico, Venezuela, and Argentina. The Royal Dutch made its first sales in this country with two cargoes of oil. In 1908 a survey was made of the Oklahoma oil fields, and in 1912 the 's Gravenhage Association, Ltd., was formed, which resulted in the Roxana Co. Later he developed Shell Union. California Oilfields, Ltd., was purchased in 1913, and five years later the Royal Dutch had a firm footing in Mexico.

Hated Communism

Communism in Russia destroyed all the efforts that had been put into the oil industry there by Sir Henri who became one of the most bitter opponents of communism.

Sir Henri never forgave the Soviet Union for refusing to restore the oil properties to their pre-war owners. The situation indirectly caused one of the most bitter price wars in 1927 when Standard Oil interests contracted with the Soviet Union for a percentage of its output.

He became an ardent Nazi after Hitler attained power in Germany. A practical token of his admiration for the anti-communist regime was given in 1937. He gave $5,000,000 to purchase Holland's surplus food products for Germany's "Winter Help Fund."

In World War days Sir Henri conceived the idea of ballasting cargo boats with oil instead of water. It was at a time when the storage tanks of the British fleet were empty and submarines were sinking tankers on every shore. It was for his service to the Allies that he was made a knight of the British Empire in 1920.

Sir Henri saw President Roosevelt in August, 1934, and discussed bimetallism.

In 1937, at 71, Sir Henri retired from the director generalship of a group of 200 companies with 40,000 employes. In 1936 Sir Henri presented 10,000 guilders' worth of Netherlands cattle and farm products to the German government, explaining he did so as a contribution to the fight against bolshevism.

An English biographer described him as "a quiet little man with snow white hair and mustache and a

(Continued on page 36)

Kettleman North Dome Important in California

By L. P. STOCKMAN

LOS ANGELES, Calif., Feb. 6.—**The discovery of numerous fields in California during the past decade has tended to divert attention from the Kettleman North Dome field but the fact remains this field still has the largest reserve of recoverable crude oil and gas in the state. The North dome has produced 201,983,315 bbls. of crude oil and more than 1,300 billion cubic feet of gas to December 31, 1938. Some 254 wells have been completed as commercial producers of which 69 have produced more than 1,000,000 bbls. of crude each and another, No. 1 Huffman of Superior Oil Co., has produced over 6,000,000 bbls. The oil already produced by this well would fill to a depth of approximately 39 feet a tank covering the entire 20 acres on which the well is located. By agreement among operators the spacing in this field is limited to one well to 20 acres and the 160-acre Huffman lease contains eight wells.**

Current production of the North Dome field, under the curtailment program, approximates 61,700 bbls. per day. At the present rate of production the field should have a life of between 40 and 50 years. Approximately one-half of the proved acreage comprises government leases, the federal Government being the largest lessor. Of the federal revenues from the field during the past 10 years, $12,587,077 covered crude oil, $2,803,944 was for gas and $996,837 was for natural gasoline. The peak month was November, 1937, when $295,895 was collected. The royalties are divided between the federal and state governments. The state receives 37½ per cent for construction and maintenance of public roads and for support of public schools and 62½ per cent is retained by the federal Government. Of this 62½ per cent, 52½ per cent is deposited in the federal reclamation fund for use in irrigation projects in western states and 10 per cent is deposited in the general treasury.

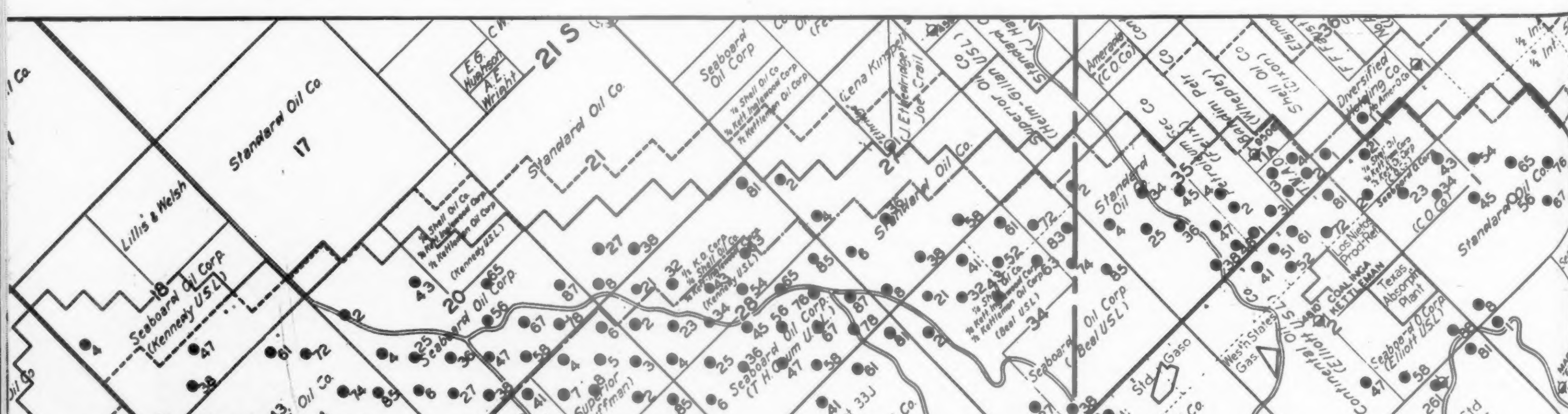
Ultimate Recovery

Ultimate production of the Kettleman North Dome field is conservatively estimated at from 750,000,000 bbls. to 900,000,000 bbls. which means it still has a normal expectancy of between 550,000,000 bbls. and 700,000,000 bbls. At present the lower estimate is believed closer. The productivity of the eastern end and the importance of the deep Avenal zone may be determining factors later when another survey is made.

Not long after completion of the discovery well in the North Dome field a shut-in agreement was negotiated at the instance of the Department of Interior, which became effective July 25, 1929. The purpose of the agreement was to prevent completion of about 30 wells being drilled and forestall a flood of Kettleman oil. Certain wells in the discovery group were allowed to produce and drilling wells were permitted to make a water shutoff above the top of the productive Temblor but were not permitted to drill into the Temblor zone and produce. The wells allowed to produce were obliged to contribute the value of 10 to 25 per cent of their production to the owners of the wells which were drilled to the top of the zone and suspended. This shut-in agreement continued for 17 months during which time Milham Exploration Co., Continental Oil Co., and Standard Oil Co. produced 5,297,262 bbls. of oil and contributed $2,046,048, representing the sales value of 1,266,044 bbls., to those operators who had drilled wells to the top of the Temblor and suspended work in conformity with the agreement.

Owners of fee acreage in both the Huffman and Felix sections did not participate in the agreement as the field had not been extended that far on the structure. The owners of this fee property did not see the wisdom of including their properties in the unit plan and forced their operators to prosecute development independently of the Kettleman North Dome Association which later unitized drilling and production activities in conjunction with Standard Oil Co. which, through purchase of Pacific Oil Co. properties several years previously, had obtained fee title to every alternate section of 640 acres.

In spite of unit operation by Kettleman North Dome Association and Standard Oil Co. drilling and production activities were dictated for several years by operators developing fee acreage which represented less than 5 per cent of the total acreage involved as development of this acreage made it obligatory for Kenda and Standard to drill offset wells. These operators holding less than 5 per cent of the productive acreage have produced 19 per cent of all crude oil produced to date. The responsibility, however, does not lie entirely with operators developing fee acreage as the Kettleman North Dome field has been a major source of gas for public utilities serving both northern and southern California communities. The rate of gas withdrawal has been an important factor in producing the field. During December,



Is Still Most

1938, the latest data available, the North Dome field produced 1,855,881 bbls. of crude and more than 10-853,925,000 cu. ft. of gas. From the gas processed, eight natural gasoline plants recovered 15,873,490 gallons of natural gasoline. Total gas treated in the state during December was 32,839,660,000 cu. ft. so the North Dome field accounted for more than one-third. Total state production of natural gasoline was 55,457,049 gallons.

The free and open outlet that has been maintained for gas coincident with a restricted outlet for crude has tended to dissipate the gas cap that at one time filled a restricted elliptical area in the central part of the field. This gas cap, instead of maintaining its central position, moved down structure where withdrawals were heaviest and as a consequence has either been dissipated or sold. It is probable this reduction in gas volume accompanied with a corresponding drop in bottom-hole pressure will greatly shorten the life of the field and necessitate repressuring sooner than necessary if gas production had been reduced proportionately with production of crude. At one time during the early life of the field, several wells in the Huffman section were producing gas at the rate of from 100,000 cu. ft. to 200,000 cu. ft per barrel of crude oil and during one month an average of 311,073,000 cu. ft. of gas was blown to the air and only 170,000,000 cu. ft. of gas utilized. To curb unrestricted production of gas, court action was instituted to force compliance with the California gas law which prohibits all forms of gas waste, including surface and underground waste but no lasting benefit was derived.

Pressure Maintenance

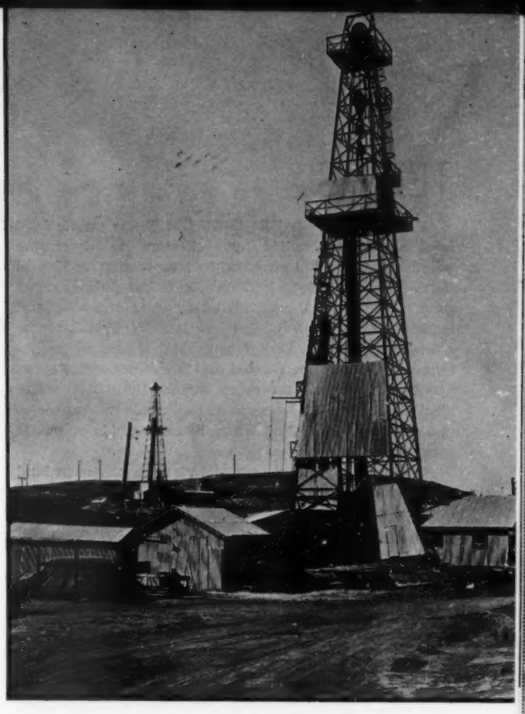
Pressure losses in the North Dome field have been largely due to excessive gas withdrawals which result in the production of five to six volumes of gas per volume of crude oil. Approximately 20 high gas-oil ratio wells have contributed more to the depletion of reservoir energy than all other wells. There is little doubt the ultimate recovery would be increased if the reservoir-energy could be utilized uniformly over the field. Prospects of pumping oil from below 8,000 feet are distinctly unfavorable, physically and economically. In the absence of a uniform water encroachment and a definite lag in the rate of encroachment, pressure maintenance becomes of vital importance. Edgewater is not encroaching fast enough to maintain pressure and this reduction in pressure is not confined solely to the competitive areas but has spread to wells three to six miles from production.

Recent Litigation

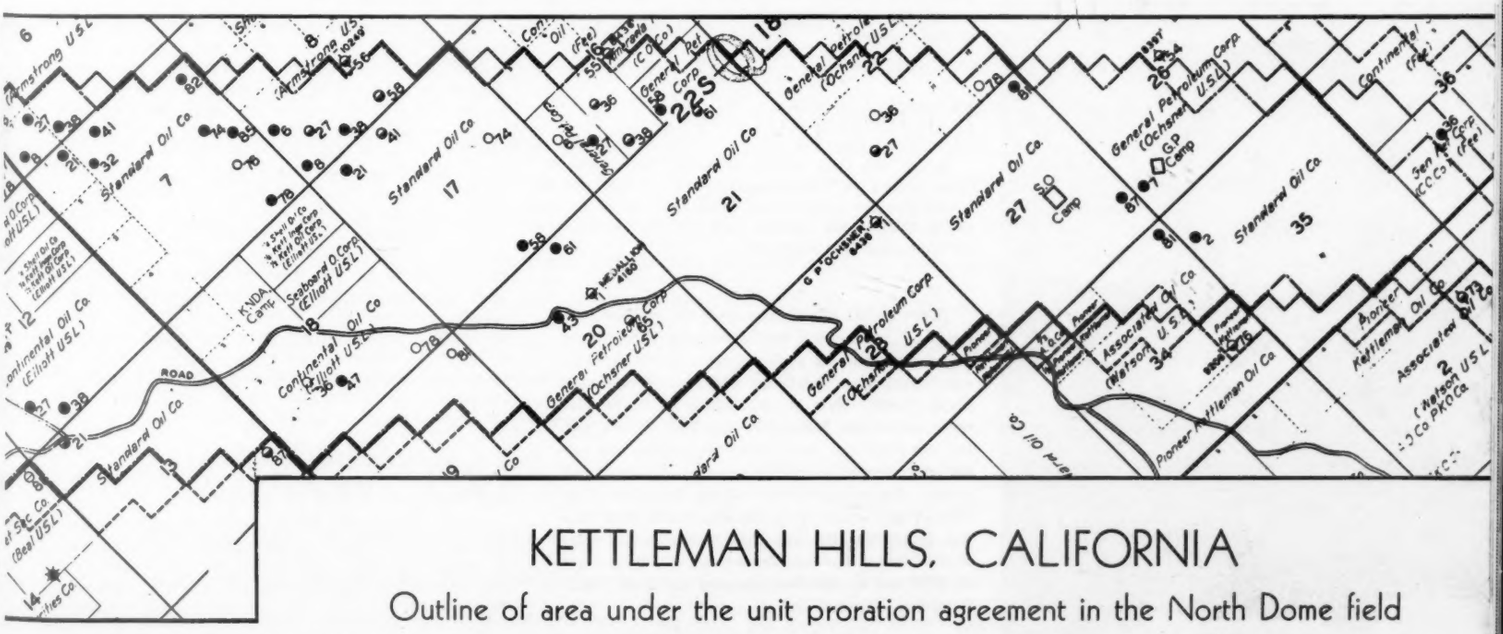
After a hearing extending over two years Superior Judge Minor Moore has handed down a decision that directors of the Kettleman North Dome Association acted in accordance with generally accepted practice of oil field development and within the articles of incorporation of the association when they reclassified certain properties and excluded this acreage from further participation in the operation of the association. The suit instituted by Shell Oil Co., later joined by others, cost over $1,000,000. Shell claimed directors of the association failed to consider zones below the productive Temblor, especially the Vaqueros, Kreyenhagen and Avenal zones, in making decisions regarding the participating acreage. The Avenal zone was subsequently proved fairly productive far out on the north plunge of the anticline but this development did not change the flank positions of the properties. Shell also claimed the board improperly delegated authority to a committee of engineers who assisted each year in determining the productive acreage and probable limits of the field.

It was also charged the board erred in outlining the field with zig-zag lines instead of the usual curve line. The court held that: "In view of the comprehensive allegations of the cross-complainants and of the extensive declarations of expert witnesses to the effect that there was no evidence before the board at the dates of the adoption of the several resolutions and that there was no available evidence by which the board could have been warranted in classifying any of the Blue lands as non-productive, the final solution of the issues presented has required a comprehensive study of the geology of the North dome, not to test the soundness of the board's conclusions, but to decide whether sufficient evidence was before them to warrant their determinations as expressed in said resolutions."

Regarding Shell's interpretation of the agreement, the court held it was not actually necessary to drill a well to determine the acceptable limits of production in a field. The court also held: "It was an intercise of judgment based upon a knowledge of geology and engineering and a knowledge of fair play among men that the board adopted the 10-acre rule. It was a reasonable rule and demonstrates a zeal on the part of the board to treat with fairness and equity all parties to the agreement. They took meticulous pains to follow the variations in the position of the productive limits with a refined accuracy. In all their deliberations they were goaded by a passion for accuracy and justice and were guided by universally accepted principles and by ubiquitous practices among petroleum engineers."



Standard No. 21-33-J offsetting Union-Amerada No. 1 King at Kettleman Hills



KETTLEMAN HILLS, CALIFORNIA

Outline of area under the unit proration agreement in the North Dome field

STATE CAPITALS

TEXAS

FAR REACHING REVISIONS of Texas public land laws are being studied by legislators to determine whether or not a bill proposed by Representative Harold Hankamer of El Paso is favorable to the public school fund. Primarily, the bill is intended to transfer land leasing activities of the general land commissioner to a board composed of the commissioner, the superintendent of public instruction and the secretary of state. The bill, however, goes much farther than that; virtually abolishing all incentive to discover vacancies and allowing sales of oil leases by sealed bids or public auction.

Under the bill, a preferential right to buy such land vacancies would be held by the person occupying the land through honest mistake, or holding adjacent land. When they have been found heretofore, the vacancies were purchased by the finder and the mineral rights of the vacancy went to the state.

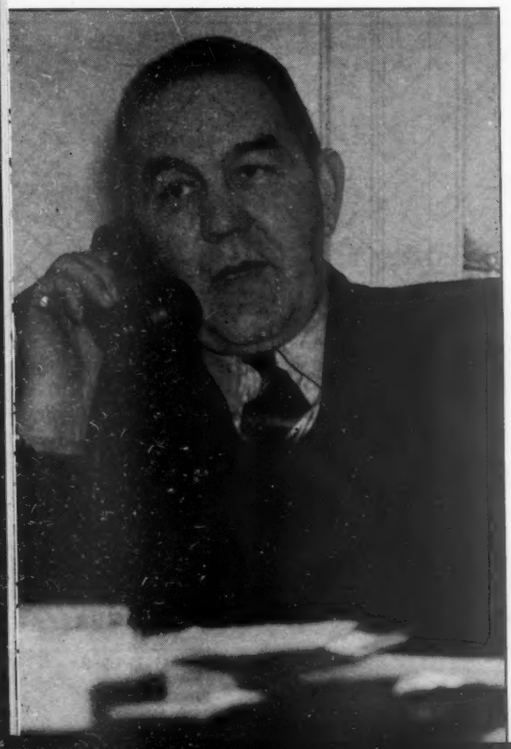
AN UNEXPECTED CALL FOR a statewide proration hearing on February 20 has been made by the Railroad Commission. Chairman Lon Smith in calling the hearing, however, stated that it would not be a statewide hearing in the usual sense, as it will deal only with the adjustment of allowables between wells and fields. While no complaints of discrimination have been received that would necessitate the holding of such a general hearing, Commissioner Smith stated such inequities did exist, having arisen from the granting of special allowables to certain fields. Plans also are being made to include the holding of the monthly statewide gas hearing.

PERMITS IN EXCEPTION TO RULE 37 for drilling in the East Texas field are being granted with much less frequency since Commissioner Jerry Sadler took office the first of this year. To date, 122 applications for drilling permits in exception to Rule 37 have been acted on by the commission, and of this total 58 were granted and 64 were denied. Of the total number granted, 39 were issued on January 5 with former Commissioner Terrell being one of the members hearing the cases. Thus only 19 have been issued since Sadler took office. A break-down of permits granted and denied, by counties, since January 1, 1939, is as follows:

	Gregg	Rusk	Smith	Upshur
Denied	45	17	0	2
Granted	37	17	3	1
Total	82	34	3	3

Thus it is apparent that Sadler is living up to his campaign promises of reducing the number of East Texas wells drilled in exception to Rule 37, and as a result drilling activity in that field will show a decrease in future months if the commission's present policy is followed.

A NEW INVESTIGATION UNIT to handle oil materials which require an audit by commission accountants was established by the Railroad Commission last week. The new unit is under the direction of W. A. Weeks, commission auditor, who has two field men checking under his direction. The order provides that this division will handle all audits and investigations of the books and records and operations of producers, transporters, storers, refiners, treaters and/or marketers of crude oil, natural gas, and/or the products of the same. Mr. Weeks will have complete charge and be directly accountable to the commission.



JOHN ESTEN MILES, new governor of New Mexico, is 54 and a native of Murfreesboro, Tenn. When 17 he moved to an uncle's farm in Texas, spent a year farming in Oklahoma and landed in Endee, Quay County, New Mexico, where at 21 he filed on a homestead. Selling his farm in 1918 and moving into Endee he was named postmaster, and subsequently served as county assessor, deputy sheriff, county chairman, secretary of the State Tax Commission and secretary of the Democratic State Central Committee. He was chief of the field division of the Internal Revenue Department at Albuquerque in 1934 and at one time operated the New Mexico Democrat. (Pictures Inc.).

KANSAS

AN ATTACK on the Kansas Corporation Commission's orders prorating natural gas in the Hugoton field, southwestern Kansas, had been filed Friday in federal District Court at Wichita by the Republic Natural Gas Co. Members of the commission and all conservation agents are listed as defendants.

The company alleges that enforcement of the commission's orders would cause a loss of $210,000 annually and would limit its production to approximately 55 per cent of its market requirements.

FEBRUARY GAS ALLOWABLES of 1,035,000,000 cu. ft. for the Otis field, Rush and Barton counties, 423,000,000 cu. ft. for the Burrton field, Reno and Harvey counties, and 336,000,000 cu. ft. for the Lyons field, Rice County, are allocated in well schedules mailed operators in the areas by the Corporation Commission Saturday.

INDIANA

MEASURE HAS BEEN INTRODUCED in the Indiana House of Representatives (H. B. 214) which would give the conservation department broad powers to regulate the oil and gas well industry and provide for limitation of production.

ILLINOIS

A SUMMARY OF BILLS PERTAINING to oil regulation introduced in the Illinois General Assembly in the past week follows:

Senate Bills: No. 82—By Senator John J. Parish (D., Centralia)—Compels drillers for oil and gas to make bimonthly reports of progress and findings to the state Department of Mines and Minerals. Referred to the senate committee on oil and gas conservation.

No. 83—By Senator Parish—Requires drilling of offset wells. Referred to committee on oil and gas conservation.

No. 84—By Senator Parish—Prohibits discrimination in the purchase of oil offered for purchase and provides penalties. Referred to committee on oil and gas conservation.

House Bills: No. 169—By Representatives Sidney Parker (D., Texico), and Schuyler B. Vaughan (R., Greenville)—Owners of interests in real estate who contract to permit drilling for oil or gas for one-eighth interest in proceeds can sell only half of such (one-eighth) interest. Referred to the house judiciary committee.

No. 171—By Parker and Vaughan—Drillers for oil and gas who do not discover anything of paying quantity within 60 days to cease drilling well and abandon it. Referred to the house conservation committee.

No. 171—By Parker and Vaughan—Drillers for oil and gas must file notice of intention to drill 10 days before commencement, and give a $10,000 surety bond to the state department to insure faithful compliance with lease and royalty agreements. Referred to the house conservation committee.

IN AN OPINION WHICH TAX officials said would subject millions of dollars worth of Illinois oil leaseholds to property taxation, Attorney General John E. Cassidy held that leases and royalties are "real estate" under state law.

The opinion was regarded as having wide importance to oil producing counties because royalties and most leases have not been assessed for local taxation. Some counties, the attorney-general's office said, have taxed leaseholds after oil production started.

John Pugh, Centralia, independent operator, summed up the opinion of many experienced producers when he said: "I can't imagine how any tax body would determine the value of a non-productive lease.

"I don't know of any state where this has been tried. When engineering firms audit your holdings, they place no value on undeveloped leases because they actually have none."

CALIFORNIA

THE EMERGENCY EXECUTIVE COMMITTEE of Independent Oil Operators which has charge of the present curtailment program in California has condemned the transfers of allowables from one field to another and thus has approved a move sponsored by smaller operators. Final vote on the resolution, which was introduced by Ross McCollum, a member of the Central Committee, and also a member of the Emergency Committee, favored its passage by three to one. Transfer of allowables is the practice of shutting down oil production from a low gravity and low output field and then taking credit for that amount of production from a higher gravity, more prolific and profitable field. This practice has made it possible for certain companies to shut down production in one field and overproduce in others, but by taking credit for the allowable of the shut-down wells, still show an overall picture of compliance with the company allowable figures set up by the state oil umpire's office.

NEW MEXICO

GOVERNOR JOHN MILES went personally before the New Mexico State Legislature on Friday, February 3, to urge a two-year extension of the state's membership in the interstate oil compact, which expires on September 1.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Green Light for Gas

The current revival of interest in the expansion of natural gas transportation and distribution is calling attention to the vast markets yet untouched by this fuel.

The past few years have been comparatively quiet so far as the construction of new major natural gas pipe lines is concerned, due largely to the uncertainty in regard to governmental regulations and the undue consideration being given to agitation by competitive fuels.

Preliminary figures show that, despite the severity of the business decline in the past year, the natural gas industry had more customers than in any previous 12 months and, including carbon black, more natural gas was consumed than in any previous year. The only substantial decline was in industrial consumption and this was less than 15 per cent.

This is all the corroboration needed so far as the public attitude is concerned.

Without any special effort being made to develop new reserves (many of the great gas reserves of the West and South having been developed as an incident in the search for oil), the natural gas reserves of the country are today greater than at any time in the industry.

It is estimated that the reserves in gas fields now being tapped total 75 trillion cubic feet or enough to last for at least 30 years at the present rate of consumption.

The point here is that while certain areas are producing all the gas they should, there are other tremendous reserves which have outlets entirely inadequate.

The evidence of the importance of natural gas expansion to other industries and the general economic development of the country is uncontroverted. For example, the line being proposed from Kansas fields to serve markets as far north as Minnesota which now have no natural gas fuel will call for an initial expenditure of $20,000,000, the bulk of which expenditures would go to the steel industry and to its many affiliated industries.

But this is merely the beginning. Other millions must be expended for distributing lines and the gas appliances which the new consumers will require when this economic and clean fuel is made available.

Further, this new line would furnish fuel for concentration of low-grade iron ore, a development that will enlarge the supply, not only a local aid to industry, but a factor in the availability of steel to other industries. This is just an indication of the benefits which follow gas.

In the light of this situation regarding supply and consumption and the aid to general industry, it is apparent that no consideration should be given to the camouflage put out by competitive fuels which are largely responsible for the delay in extensions to existing pipe line systems and the construction of entirely new systems.

These efforts to circumscribe the use of natural gas are made only to bolster their own weakness because they have been unable to maintain their position in the consuming market.

The natural gas industry has made its way without preferential legislation, state or federal assistance, simply on a basis of economy and service in furnishing a fuel which has been welcomed by consumers. On the other hand, its competitors are trying to force consumers to use, not what they want, but what they insist they take.

The gas industry gives the consumer not only a clean and more economical fuel but facilities which no competitor can offer. For instance, nearly 700,000 water heaters were sold last year, a service not otherwise available at the same cost.

Natural gas has succeeded because it has been a progressive industry. It has made and extended its own markets. It is prepared to expand them still farther, if it is given the green light.

Refinery Runs Are Too Great Declares Colonel Thompson

AUSTIN, Tex., Feb. 6.—A further warning to the oil industry was given by Colonel Ernest O. Thompson, chairman of the Interstate Oil Compact Commission and member of the Texas Railroad Commission, in a statement issued Saturday:

There is one very bad fly in the ointment, to use this expression, covering the oil situation today, and that is that runs to stills of crude have been exceedingly high of late. It has been calculated that arriving at the beginning of the consuming season, say March 31, 1939, with the proper amount of gasoline, which would be 82 or 83 million barrels, runs to stills over the six months period beginning October 1, 1939, should not exceed 3,100,000 bbls. per day. For a few weeks, in fact for two months, it appeared we were marching toward that goal, but since January 1, runs to stills have been very high, and for the week ending January 21, the average daily run to stills was 3,310,000 bbls., which was certainly 300,000 bbls. per day too much. If this rate of runs to stills is continued, instead of arriving at the beginning of the consuming season with 82 or 83 million barrels, we will in fact arrive at March 31 with around 95 to 100 million barrels. Of course it is out of reason, and will be greatly in excess of what we had on hand at the beginning of the consuming season in 1938, which was 92 million barrels, the record-breaking inventory, which inventory broke the price for last year and has continually threatened the entire industry with destruction.

Curtailment

The regulated end of the industry, namely production, has been outstanding in its curtailment. The Bureau of Mines estimated that for the month of January, the estimated market demand for the nation for crude was 3,270,000 barrels daily. The actual production of the entire United States each day for the week ending January 21, was 3,270,691 bbls. This is hitting the peg on the head. This has been done by strenuous and sincere efforts on the part of the states that have regulatory bodies and conservation laws. This has been done in spite of the fact that some states have no conservation laws and are producing rather wide open. It is truly a remarkable achievement. With 21 states producing oil, and with such unified efforts, the producers of the nation should be congratulated on keeping production this close to market demand. Thus the regulated end of the industry is doing a workman-like job.

The unregulated end of the industry, namely the manufacturing end called refining, is running more or less wild. Those people in the industry who are asking for less interference in business by government have here a splendid chance to show some business statesmanship and get the unregulated end of the business in better condition. Unneeded and unnecessary gasoline storage above all needs can do nothing but play havoc with the entire industry as well as to cause decided, cognizable, physical waste. I am hopeful that the refiners of the nation will promptly remedy this situation and prevent impending disaster. No good can come from unwanted and unneeded surpluses in any commodity.

It is well to call attention to the fact, which seems to me to be significant, the United States produced in 1938, 61.4 per cent of the world's total crude petroleum. Since 1927, when the United States produced 71 per cent of the world's supply of crude, our production in relation to the world's production has greatly declined. This is not due to the inability of our fields to maintain the pace set by the various oil producing countries of the world—it does mean that because of proration our participation in the world's market is becoming less and less. We do not wish to stand by and see our markets gradually absorbed by foreign produced oil. Conditions which have resulted in the orgy of drilling in the United States have at the same time attracted foreign capital in exploration of areas over various parts of the world. We cannot prorate the world, and in the final analysis we must either be able to compete in the markets of the world or withdraw.

It is well for us to study seriously the effects of proration. It has now been long enough tested that we may begin to take stock on the effects of proration. It is my conviction that it is best for us to limit our efforts as regulatory bodies to the actual prevention of cognizable, physical waste in the production of oil and gas. I believe that if we truly put into effect all of the known methods of preventing actual physical waste in the production of oil that we can not be producing currently in the United States more oil than we can use. This will mean that all states, of course, should do such simple things as producing their wells with the most efficient gas oil ratios, preserve bottom-hole pressures, and in short, produce their oil in such a way as to obtain the greatest utilization of reservoir energy from whatever source it may come.

One observation will illustrate what I mean when I say we should check up on what proration is doing: People drill more and more wells to meet their continually reduced income, caused by lower allowables brought about by proration and conservation. They spend more money to get more oil when as they drill wells each well gets less oil, and I wonder if we are not approaching the point where the law of diminishing returns will become effective. Some think we have reached the point now. The state of semi-stability, which has been brought on by the seeming security of proration, has attracted almost unlimited capital into the oil producing business. We are about to overbuild the plant. More money is being put into the ground than possibly will ever come out.

Commission's Sole Duty

In another statement issued earlier in the week Colonel Thompson said:

Those who drill oil wells in these days when the outlook for the sale of oil is most discouraging must do so at their own risk. We want the entire industry to know that the Texas Railroad Commission cannot sell the oil for them.

The commission does not sell oil; it is not our duty to sell oil; we don't have the authority to sell oil. Our sole duty is to try to write reasonable rules and regulations for drilling wells with the purpose of preventing actual cognizable, physical waste in the production of oil, and when we do that our power has been exhausted.

I make this statement because there is a prevalent feeling that the commission can help those in distress get connections. We are perhaps responsible, due to the fact that last autumn we did ask for relief for several hundred wells when everybody was trying to cooperate in an effort to keep the industry stable.

But the fact that we were successful last year does not mean that we are going to continue to seek connections for those who drill more wells and bring in oil which the normal economic processes cannot absorb. There is already more oil than anybody wants.

While not attempting to assign any reason for the present situation, it should be pointed out that in 1927 we were producing 71 per cent of the world's oil. Last year we produced 61 per cent, and in the intervening 11 years our reserves have more than doubled despite the production and sale of approximately 11,500,000,000 bbls.

Bearing upon the same situation are technological advances in the industry which make it possible to get far greater recoveries of gasoline for a barrel of oil.

It all sums up to too much oil. It may be that proration itself, by lending a quasi stability to the industry, has attracted funds for the drilling of more and more wells. We try to hold production below actual consumption. It was reasonable to suppose that when supply is kept below demand, a firm position would be developed. Much to the surprise of everybody, the price broke and we have decided that there must be something more than statistics to study in proration. Perhaps the oil industry is on the outer fringe of the same debacle into which cotton was plunged by government regulation. To assure prosperity to the cotton farmers the Government advanced money, and for a time everything was lovely. Then they began raising cotton in other countries, and we lost our cotton business.

The same thing can happen in oil, and all that is needed to make it happen is for those in the business to keep on drilling unnecessary wells and producing more oil than the market will absorb. It seems that the only way some people can learn to invest their money prudently is to lose it. Happily, the commission is not obligated to guarantee that these unneeded wells will be profitable.

I should like it to be understood that the fact that the commission promulgates a certain spacing pattern in any field does not mean that every well which could be drilled under that pattern will be drilled.

The commission orders spacing which a majority of those interested in the field testifies will best prevent waste, but if the operator does not care to put his money into the oil well, we cannot require him to do so.

Thompson Says:

We cannot prorate the world.

Runs to stills have been exceedingly high.

There must be something more than statistics to study in proration.

The Texas Commission cannot sell oil. We are not going to continue to seek connections for those who bring in more oil than normal processes can absorb.

Mid-Continent Strike Still Awaiting Developments

In the middle of the second month of the strike called against Mid-Continent Petroleum Corp. in Oklahoma by the Oil Workers Union, C.I.O. affiliate, no solution is in sight which would lead to a settlement before the hearing to be called by the N.L.R.B. in Tulsa, not yet set. The past week has been marked by discussions on the part of state and county officials as to the course in dealing with conditions which have given rise to increasing complaints of violence. Picketing at a point half way between the sentry lines of the National Guard and the refinery gate at West Tulsa has been discontinued. Within the past few days, the union has asked for the privilege of picketing directly in front of the gate, but has been opposed by Sheriff Marrs.

Wage-Hour Rules on Applications to Oil Employes

By H. D. RALPH

WASHINGTON, D. C., Feb. 6.—Three months of operation of the Fair Labor Standards Act —the wage-hour law—have settled most of the questions of the types of occupation and classifications of employes covered by the law as well as these can be settled prior to court interpretations, and attention is now being given to the troublesome problem of overtime of salaried employes.

Informal opinions of the general counsel of the Wage and Hour Division of the Department of Labor indicate that most all employes engaged in any aspect of the production, transportation and refining of petroleum are considered to be engaged in commerce and therefore covered by the act with the exception of employes of retail establishments who are specifically exempt.

In the near future hearings will be held on the question of exempting from the hours provision "white-collar" workers in the high-salaried brackets who do not come within the specific exemption for professional, administrative or executive employes but who have a certain amount of responsibility and freedom from supervision. The rigid requirement of the act that all covered employes be paid time and a half for overtime beyond 44 hours per week has caused many protests as applied to office workers not paid on an hourly basis and who occasionally work overtime but who are not docked for time off for sickness or other legitimate reason. The problem likewise applies to office employes in almost every type of business. It has been suggested that the overtime provision should not apply to persons with a monthly salary above a stipulated minimum to be set somewhere between $150 and $400 per month, but it has not been decided whether this can be done through an administrative regulation or whether Congress will be asked to amend the law. The problems involved will be discussed at the forthcoming hearing.

Unified Pattern

Questions as to application of the law to various occupations in the oil industry are being answered along a unified pattern, and so far as the files of the Wage and Hour Division reveal no occupation has been ruled specifically exempt. The basis for these rulings is Section 3 (*j*) of the act, which provides that "an employe shall be deemed to have been engaged in the production of goods (for commerce) if such employe was employed in producing, manufacturing, mining, handling, transporting, or in any other manner working on such goods, or in any process or occupation necessary to the production thereof, in any state."

Since the term "mining" has been held to include the production of petroleum, the division has consistently ruled that all workers in the production end of the oil industry are covered by the act. General regulations impose on the employer the burden of proving that any particular employe's job has no relation to the production of goods for commerce.

A typical answer to an oil company by the general counsel's office reads as follows: "The act applies to employes engaged in commerce or the production of goods for commerce. The words 'produced' and 'production' are given an exceedingly broad definition in Section 3 (*j*) of the act. An employe shall be deemed to be engaged in the production of goods if employed in producing, mining, or in any other manner working on such goods or in any process or occupation necessary to the production thereof. It is our opinion that employes engaged in drilling oil wells or producing oil are engaged in the production of goods for commerce within the meaning of this section and are therefore subject to the act. This would include employes cleaning out the casing, doing the cement work, and coring the top of the sand."

This answer has been given to independent drilling contractors as well as to producing companies having their own well crews. Asked about the status of employes of a drilling crew which produces a dry hole, an official of the Wage and Hour Division took the view that the drilling of dry holes is an unavoidable necessity to the production of oil and therefore subject to the act. The same reasoning would make the act cover oil prospecting operations.

Maintenance Crews

Service and maintenance crews are covered by a ruling applicable to all industries, which states:

"The fact that one travels across state lines to get work does not necessarily mean that he is engaged in commerce. However, if these men are engaged in maintenance work on mechanical equipment used in the production of goods for commerce, they may be considered as 'engaged in the production of goods for commerce' within the broad statutory definition of production as including 'any process or occupation necessary to the production.'

"On the question of installation of mechanical equipment the courts have held that where the installation is provided for in the contract for the disposition of mechanical equipment across state lines, it is a part of the interstate transaction. For this reason it may well be held that the employes engaged in such installation are engaged in commerce.

"Similarly, some courts have regarded the repair and servicing of goods sold in interstate commerce, where maintenance of the goods, for a short period of time, is provided in the contract of sale, as incidents of an interstate transaction. Taking this view it may be held that such workers are also engaged in interstate commerce. In cases of doubt such as this, the administrator has frequently urged that the wisest policy is one of compliance."

This view has been repeated by the general counsel in answers to specific inquiries. Excerpts from some of these letters read as follows:

"The employes of your maintenance crew, whose only duties are to repair your machinery, would seem to be performing duties necessary to the production of goods for commerce. I believe this same should be said of the men who inspect your products. I also believe that the same thing would apply with respect to your building maintenance crew and employes in charge of your stockrooms and tool cribs. I believe that your shipping clerk would be considered under the act."

In addition to these specific opinions regarding various occupations, there have been many informal rulings on the subject of where interstate commerce begins and ends, but these rulings exhibit no deviation from the general regulations and interpretive bulletins issued publicly some time ago. For example, it has been held many times that where a producer of petroleum or other commodity sells all his output at the point of production he is considered to be in interstate commerce if he had good reason to believe that his product ultimately would cross a state boundary even though ownership might transfer several times.

Court Tests

Court decisions ultimately may clarify the law further or give judicial weight to the opinions of the division's staff, but it will be some time before any important decisions may be expected. Only one suit to enforce the act has been filed to date and while the division is anxious to get some representative test cases its inspectors have almost invariably found that an employer promises to comply with the law and make restitution to his employes as soon as he discovers that his payroll records are being checked.

The appointment of an industry committee for the oil industry is a matter for the indefinite future, as so far only a few industry committees have been appointed and none of these have completed their work. An industry committee has no jurisdiction over employes covered by the act nor over the length of the work week or the overtime provisions, and its sole task is to recommend hourly wages for various classes of occupations higher than the minimum set by the law but not in excess of 40 cents per hour. At present the minimum wage is 25 cents and beginning October 24, 1939, it will be 30 cents, but thereafter the law does not require any increase for the next six years, after which the minimum will be 40 cents per hour. The first industry committees are therefore being created in the low-wage industries, and little attention is being given at this time to wages in the petroleum industry.

Whether truck drivers and maintenance crews are covered by the wage-hour law or by the motor carrier act is a question of jurisdiction which is now being considered by the Interstate Commerce Commission.

A questionnaire to the oil industry is being prepared by the Federal Trade Commission as a part of the monopoly study of the Temporary National Economic Committee, it was learned today on reliable authority. It is believed the questionnaire has to do with details of marketing and distribution, and is to supplement broader studies of the oil industry made by the Department of Justice.

Southeastern Kansas Stripper Well Problem Is Settled

The southeastern Kansas stripper well problem again appeared to have been "solved" late last week with the announcement of Governor Payne H. Ratner that Sinclair Prairie Oil Marketing Co. had agreed to reopen connections and resume purchases from wells in Montgomery and Labette counties.

The agreement, the governor said, provides for the company to take oil from all wells in the two counties with which it had connections, retroactive to September 1, 1938, with purchases on the 50 per cent pipe line proration basis effective in recent months. The governor was quoted as saying the company would increase purchases to 100 per cent as rapidly as market conditions will permit.

The stripper problem became acute last fall when the company planned to cease purchases in these counties. Well owners appealed to the Corporation Commission, and court action was threatened. Before legal action, the operators agreed to take over the gathering lines, collect the oil and deliver it to the company's main pipe lines on a 100 per cent basis. A group of stripper operators, said to represent 70 per cent, organized Producers, Inc., to collect the oil and deliver it for a gathering charge of 7 cents a barrel. This organization took over the gathering lines, totaling around 200 miles, for which it was to pay about $75,000 over a period of years. C. I. Layton, independent operator of Independence, was president.

About 30 per cent of the well owners, however, opposed this plan; objected to the gathering charge and appealed to Governor Ratner who conferred with officials of the major company, and the agreement followed. Producers, Inc. agreed to return the gathering lines to Sinclair Prairie.

The well owners are divided as to the results of this settlement. Those opposing passing the gathering charge to the producers, believing it would set a precedent for producers throughout the country, approved the new plan. Those favoring the Producers, Inc., plan expressed the belief the settlement negotiated by the governor was a "grave mistake."

E. W. Hayes, Independence, spokesman for Producers, Inc., said: "In accordance with the wishes of Governor Ratner and not desiring to be in conflict with his plans, the stockholders of Producers, Inc. have agreed to a rescission of its agreement with Sinclair companies for purchase of 100 per cent of oil produced in Montgomery County and transfer back to Sinclair its pipe lines in the county.

"The stockholders and officers of Producers, Inc., do not agree with Governor Ratner in this matter. They have consented to it wholly and entirely because of the fact they did not wish to be in a position of being in conflict with the governmental authorities of this state, as well as with the marketing company.

"They felt it was a great mistake to compel them to abandon a plan by which they had procured an unlimited market for oil to be produced in the county. The producers in this county cannot live on a 50 per cent basis. They assure Governor Ratner of their hope that he can get a better market than that."

Governor Ratner termed the agreement of far-reaching importance, meaning that thousands of Kansas stripper oil wells will have a market as long as recoverable oil is available. He was quoted as saying the company's attempted withdrawal raised the question whether the state in the public interest could act through its conservation laws to protect a natural resource, adding he was confident it could.

Madison Case Set for October 2 in Chicago

CHICAGO, Feb. 6.—Federal Judge Walter C. Lindsey last week set October 2, 1939, as the date of the second trial of the Madison oil case. Judge Lindsey said present plans were to try those who did not enter nolo contendere pleas in what is known as the second Madison case. No date has been set for the trial of those who were granted new trials in the first case.

Judge Stone sustained the convictions of only 17, set aside the verdict and freed 11, and granted new trials to 18 on the grounds they were linked to the alleged conspiracy only by circumstantial evidence.

The 17 convicted defendants have appeals pending in the United States Circuit Court of Appeals. Also under advisement by the Circuit Court is a mandamus action of the Government seeking to expunge Judge Stone's order in which he freed 11 of the defendants.

Should the Circuit Court reverse Judge Stone in the case of the 11 defendants, Judge Lindsey said it was probable they would be retired with the other 17 defendants.

Surtax on Undistributed Profits Is Challenged

WASHINGTON, D. C.—Peppers Gasoline Corp. of Oklahoma City charges that the federal surtax on undistributed profits is unconstitutional in a petition to the Board of Tax Appeals for redetermination of a $36,342 deficiency in 1936 income and undistributed profits taxes. The petition said the undistributed profits tax "makes unlawful distinction in classification among taxpayers" and "denies to the taxpayer due process."

Summary Gasoline Cut Enjoined, Rescinded

VICTORIA, British Columbia.—An order of the British Columbia fuel board, reducing gasoline prices in the province by 3 to 6 cents per gallon, has been formally rescinded. The order, issued October 24, never became effective owing to a supreme court in junction restraining its enforcement.

Named Senior Gas Engineer By Arkansas Board

Lloyd L. Jordan has been employed as senior gas engineer by the Arkansas Board of Conservation, it has been announced by O. C. Bailey, chairman of the board. Mr. Jordan is a native of Booneville, Ark., and graduated from Ouachita College, Arkadelphia, in 1929. Upon graduation he became apprentice gas engineer with Sinclair Prairie Oil Co., working in the Mid-Continent until 1934. In 1934 he returned to Arkansas as gas engineer for Lion Oil Refining Co. and has been associated with it in Texas, Louisiana and Arkansas until his employment by the Board of Conservation. Mr. Jordan brings the Arkansas Board of Conservation engineering personnel to six. The board has adopted a policy of employing only experienced licensed petroleum and natural gas engineers and geologists.

LLOYD L. JORDAN

Prunty Production Co. Starts Test in Mason County, Neb.

HASTINGS, Neb., Feb. 6.—Prunty Production Co. of Ponca City, Okla., is drilling a test on the Katzburg farm two miles south of this city in Adams County, in about the center of the south half of the state. A rotary outfit is being used and it is said the well will be drilled to at least 4,000 feet unless commercial production is found at a shallower depth. The operation will be active 24 hours per day.

The Prunty group has a large block in Mason and adjoining counties and Hastings business men have gathered up 10 80-acre leases not far from the well.

Standard Marine Department For Independent Union

NEW YORK.—Licensed officers and engineers of Standard Oil Co. of New Jersey marine department have selected the Standard Tanker Officers Association as their official collective bargaining agency. Results of an election held recently were announced February 2 by the National Labor Relations Board.

Out of the 320 ballots cast by deck officers from an eligibility list of 323, a total of 299 favored the independent union, 13 were cast for the National Organization of Masters, Mates and Pilots, a C.I.O. affiliate, and 8 named no organization.

The engineers had 341 eligible votes and 334 were cast. The Standard association received 267 votes, the Marine Engineers Beneficial Association got 61 and 6 voted to have no organization.

THE MARKETS*

CRUDE OIL: *Phillips Petroleum Co. raised its prices for sweet and sour crude 8 cents in the Panhandle area of North Texas, meeting the schedule which Humble Oil & Refining Co. established last October. Production in Illinois, a weak spot in the crude market, jumped to a new high.*

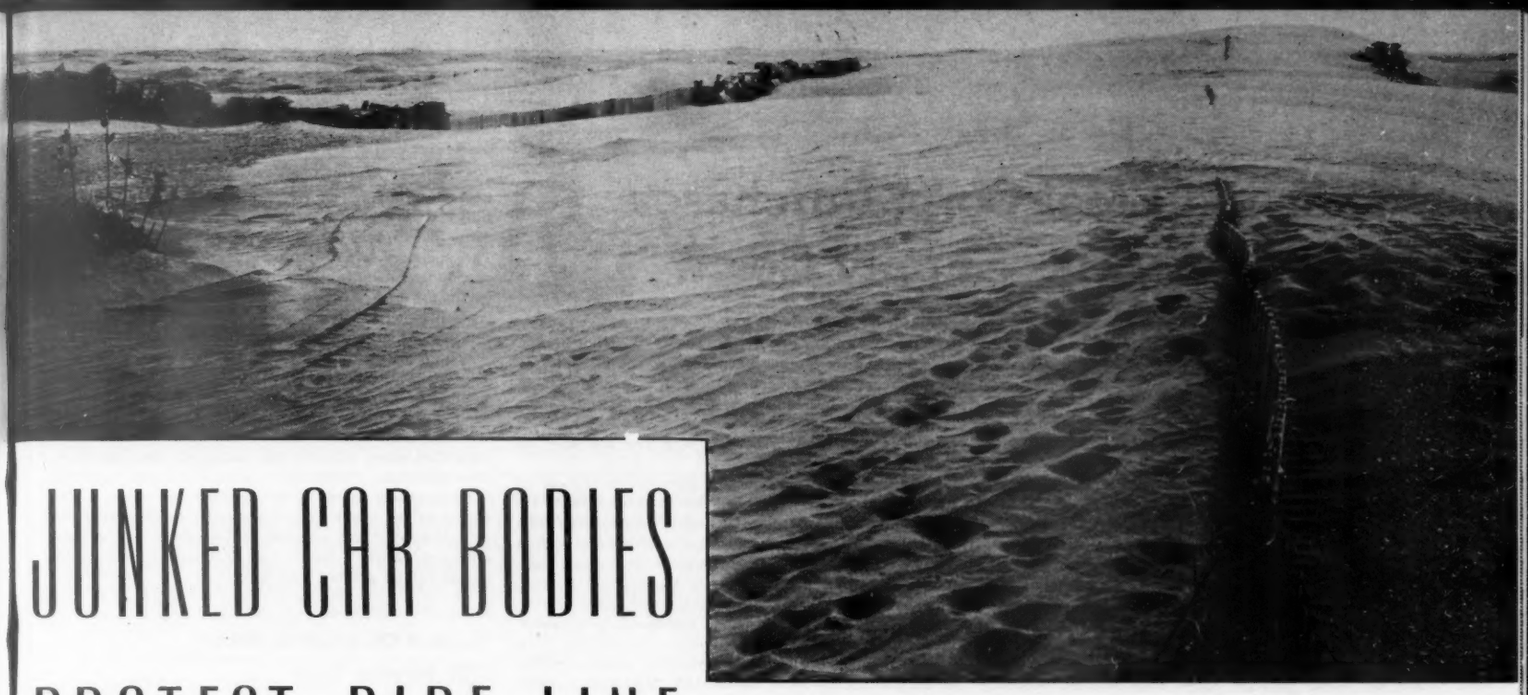
REFINERY: *Although gasoline was unsteady in the coastal areas, it was showing increased firmness in interior territory, with some refiners seeking material. Light fuels were slightly steadier except on the East Coast, where they were affected by soft tanker rates. Natural gasoline, under pressure of field inventories, was off.*

TANK-WAGON AND POSTED DEALER: *Only a few scattered changes to effect local adjustments.*

FINANCIAL: *Oils had an inactive week and moved generally with the industrial shares, showing a loss for the week. Average of 30 representative stocks for week ending February 4: High, 27.98; low, 27.06; close, 27.68. Week ending January 28: High, 28.12; low, 26.34; close, 26.97. Annual earnings of three companies, as reported by Carl H. Pforzheimer & Co., New York, follow:*

	Net income	Earned per share
Atlantic Refining:		
1938	$4,317,000	$1.40
1937	9,935,045	3.51
Plymouth Oil:		
1938	2,601,377	2.58
1937	2,935,342	2.85
Sun Oil Co.:		
1938	3,085,119	1.07
1937	9,544,085	3.86

Detailed information in Market Section.



JUNKED CAR BODIES PROTECT PIPE LINE

Desert scene in Kiowa County, Kansas, where the Panhandle Eastern Pipe Line Co. is using junk car bodies and highway fences to protect its 24-inch gas lines from wind erosion. The main line is at the right and the loop line at left

By Harry F. Simons

The automobile industry which furnishes most of the market for petroleum products is also furnishing old car bodies to protect the Panhandle Eastern Pipe Line Co. 24-inch gas line from wind erosion in western Kansas.

The line is the connecting link between Detroit, Indianapolis, and other points and the gas fields in Stevens County, Kansas, and the Panhandle of Texas. It runs diagonally across southern Kansas, through Missouri, and Illinois into Zionville, Ind., where it divides, one spur going to Detroit, Mich., and the other serving Indianapolis, Ind., and Ohio towns and cities. The line is 24-inch from Texas Panhandle to Indianapolis and 22-inch from Zionville, Ind., to Detroit, Mich.; it carries approximately 90,000,000 cu. ft. of gas daily to the eastern market and to towns along its route.

Service Threatened

An interruption in service of the line was threatened for a time as the wind was removing the soil cover from sections of the main loop lines crossing the "dust bowl" in southwestern Kansas. The spot causing the most difficulty was a 15-mile stretch of sand which extends from about 6 miles north of Wellsford in Kiowa County to near Cullison in Pratt County. Much of this section of the line is surrounded by country that is entirely devoid of vegetation and resembles pictures of the Sahara Desert, according to one company official. Two miles to the south is good farming land.

Sand dunes in this section cause whirling currents which sometimes erode the sand to depths from 10 to 12 feet. Much of the protective soil covering was being blown from the gas line and maintenance crews were kept busy sounding the line and backfilling where the cover was not sufficient.

Any obstacle encountered by the sand will cause it to pile up, even fences being drifted over in spots to where the livestock may roam the range at will. Realizing this, J. L. Murphy, division superintendent, and J. L. Hamilton, district foreman for the Panhandle Eastern Pipe Line Co., obtained about 50 old car bodies and placed them along the parts of the line giving them the most trouble. The junk bodies were placed close to the line on the side from which the prevailing winds blow. In a short time, soundings proved that the depth of the sand over the line was increasing and more old car bodies were added.

Install Snow Fences

However, the supply of junked bodies was not plentiful so the pipe line management borrowed an idea from the state highway maintenance departments which use snow fences to protect roadways in winter. Thousands of feet of standard snow fences were used and installed with iron stakes along the main line and the loop line which crosses the easily eroded sections.

Fences were installed in a manner to prevent possible uncovering of the line; in many cases a fence being placed to the north and to the south for protection. Monthly soundings are made by the line-walker and if a place is located where the backfill is less than the previous month, or not up to the standard required by the company, additional fences are installed. The backfill over this area now runs from 4 to 10 feet in depth.

The fence soon pays for itself in reduced maintenance costs, as crews are no longer required to keep the line covered. The possibility of a high wind removing the covering from an over-bend and interrupting the service on the line is also eliminated. The cost of the fence is about 10 cents per foot, which includes the iron posts and supports. Automobile bodies are still used in difficult cases and whenever the company can obtain them.

A similar condition is encountered in the maintenance of the field gathering lines in the Hugoton gas field but it is met by a variation of the above system. In cases where snow fences are advisable, they are sawed in half and only half the height used along the lines. Another device commonly used is to install a two-strand wire fence into which tumble-weeds are woven to form a windbreak and start drifting of the sand. This idea was prompted by the sight of fences which were drifted over due to wind-blown debris becoming entangled in them.

Along some of the lines in the gathering system, sticks made from laths sawed in half are driven in the ground close to the line from 2 to 3 inches apart. These sticks catch enough weeds to cause drifts. The field lines are smaller and are much more solidly constructed and, while they demand inspection and maintenance, they are not as great a problem as protection of the main line which is much larger and of composite construction.

The Panhandle Eastern built the 24-inch line from the Texas Panhandle through the Hugoton, Kansas, field into Indianapolis in 1931 and 1932, crossing the Mississippi River near Louisiana, Mo. As originally constructed, the line was designed to handle 130,000,000 cu. ft. of gas per day and served approximately 75 towns along the route. The 1,200 miles of 24-inch pipe was the longest gas line constructed in the United States at that time.

In July, 1936, the extension of the line from Zionville, Ind., to Detroit, Mich., was completed with the laying of 230 miles of 22-inch pipe at a cost of approximately $8,000,000. Approximately this much more was set aside for the erection of compressor stations at Montezuma, Ind.; Zionville, Ill.; Sneed, Tex.; Greensburg, Olpe, and Haven, Kans., and Houstonia and Pleasant Hill, Mo. These stations were in addition to those at Liberal and Louisburg, Kans., and Glenarm, Ill.

Expansion of Line

Distance from the wells to the Detroit market is 1,580 miles and the line is designed to deliver 125,000,000 cu. ft. of gas per day at a pressure of 150 pounds per square inch.

Further expansion of the line was started early in 1937 with the looping of the line in eight places, increase in the capacity of the compressor stations already installed and the addition of a 3,900-hp. station at Tuscola, Ill. The Liberal, Kans., plant was also enlarged to include dehydration and gasoline absorption units.

Looping of the line along the 859 miles from the Texas Panhandle to Zionville, Ill., caused the laying of 227 miles of 24-inch line and 24 miles of 22-inch line.

This large line has commanded a large interest among pipe-liners and pipe line contractors as much of the present day construction technique was developed during its building. Further expansion of the eastern gas markets served will cause the line to soon reach its peak thus forcing further looping of the line to increase its capacity.

Wheeling Steel Corp. Purchases Interest in Atlas Supply Co.

With the purchase of a large stock interest in the Atlas Supply Co., of Muskogee, Okla., by Wheeling Steel Corp., of Wheeling, W. Va., another major factor in the steel industry enters the oil well supply business on a basis which combines eastern manufacturing facilities in the production of steel products with a complete supply service to the petroleum industry.

Both Wheeling officials and J. H. McDonald, president of Atlas Supply Co., announce that the Wheeling purchase involves no change in personnel, management or policies of Atlas Supply Co., except to strengthen the company's facilities for serving the oil industry.

The Atlas organization gives Wheeling a large staff of field engineers and salesmen and the supply stores, with branch offices at strategic points throughout the Mid-Continent area. The Atlas network of supply stores and district offices includes establishments at the following points: Bushton, McPherson,, Russell, Wichita, Kans.; Ada, Chandler, Muskogee, Oklahoma City, Seminole, Stillwater, Tulsa, Okla.; Electra, Fort Worth, Greggtown, Gladewater, Houston, Kermit, Odessa, Overton, Wichita Falls, Wink, Tex.

Atlas Supply Co. has been serving the oil industry for 30 years, having been organized by Mr. McDonald in 1909. Mr. McDonald has been at the head of the company from its inception, and J. R. Brooks, vice president, has been associated with the company all this time.

Mr. McDonald is one of the pioneers in the oil industry, and especially in the Mid-Continent field. He came from Bradford, Pa., to Indian Territory in 1902 as superintendent for the Cudahy interests and drilled the first Cudahy well at Bartlesville that year. Incidentally, he placed on the pump the original Bartlesville well which had been drilled a few years earlier. Mr. McDonald later returned to Bradford as vice president and general manager of Bovaird & Seyfang, with whom he was associated for several years until he definitely cast his lot in the Mid-Continent area in 1909.

Wheeling Steel Corp. has long served the oil industry with tubular products.

SIR HENRI DETERDING

(Continued from page 27)

ready smile, brilliant dark brown eyes and somewhat swarthy—an oriental look to his face. Ordinarily composed, cheerful and affable, he pounds the desk when excited and his English falters. He has a house in the Park Lane section of London and a summer chalet, 'Olga,' at St. Moritz.

"Sir Henri Deterding's London office is a surprisingly small den across which stretches a semicircular desk. At first glance, the man behind the desk is shriveled and weatherbeaten—clerical in effect. But, though small, when he stands he gives the impression of height; a powerful impelling personality frequently has that effect with physically little men. Napoleon was little, but when he had tall men about him—his marshals and long lean Englishmen—they seemed to shrink by comparison. A painting on the wall behind Sir Henri's desk represents, symbolically, with a tactlessness which Britons complacently ignore, a column of Dutch sailing ships with the flag of the Netherlands at each masthead and, right beneath it, the Union Jack—the relative importance in the Deterding comprehension of the Royal Dutch and Shell elements.

"Sir Henri probably considers himself international. The Hollanders claim him as Dutch (although he has a strong strain of Danish in his blood), and the Britons as English. He flits between London and The Hague and maintains an office in the Dutch capital. He spends or did spend, most of his recreational periods at his country estate at Melton Mowbray, outside London. There, until about 10 years ago, he rode to hounds twice a week. A bad fall necessitated less strenuous diversions. He still is a good shot.

"In spite of the fact that Sir Henry repeatedly attacked his most powerful competitor, he enjoys an old and firm friendship with Walter Teagle, his rival at golf over a period of 20 years or more."

Of his rivalry with Standard Oil, Sir Henri wrote amusingly in the one volume attributed to his pen, "An International Oilman":

"In view of the terms of good-fellowship on which I have so long been with Mr. Rockefeller and several of his associates, it amuses me now to recall a rather acrimonious encounter I had with almost the first Standard Oil man I met shortly after my appointment as manager of the Royal Dutch company. The Royal Dutch then was comparatively small fry. Still, we were managing to keep up with the rather severe competitive pace the Standard Oil Co. was then setting for us, and it was obvious to me that this particular representative knew me by name all right, although, being a bit on the pompous side, he pretended that he didn't when we were introduced.

" 'Deterding? Let me see. Aren't you the manager of a company called the Royal Dutch?' he inquired.

" 'Yes, I am,' I retorted, 'and I sometimes think that my parents showed great presumption in not asking permission from the Standard Oil Co. for me to be born!' "

Students to Compete in Discussion Of Problems at Houston Oil Show

As a means of furthering the education of petroleum engineering students, a program of student papers has been arranged for presentation at the Oil-World Exposition in Houston, Tex., April 24 to 29, inclusive. Ed G. Lenzner, general manager, announces that the exposition management is providing cash prizes for the best papers read at this meeting in the convention hall of the Coliseum on the evening of Wednesday, April 26.

The student program will be under the supervision of a subcommittee of the drilling and production committee and consists of Professors Howard E. Degler, University of Texas, chairman; Benjamin C. Craft, Louisiana State University; J. H. Pound, Rice Institute; Harry H. Power, University of Texas, and Harold Vance, Texas A. and M. College. The universities and colleges of Oklahoma, Texas, New Mexico, and Louisiana having courses in petroleum engineering subjects have been invited to participate and two students from each will be selected to present papers. The speakers will be undergraduate students of the petroleum, chemical, and mechanical engineering departments and the papers must be acceptable to the committee as being along the lines of oil production, refining, or uses of petroleum products.

There will be eight prizes consisting of $100, $75, $50, $25, $20, $15, $10, and $5. The papers will be presented and graded in accordance with the new American Society Mechanical Engineers scoring sheet and the time limit of presentation will be 15 minutes each with 5 minutes allowed for discussion and questions from the floor. Preliminary contests will be conducted at each school to select the speaker and subject. The names of the speakers and the titles of the papers to be delivered at the oil show will be given to the committee by April 1, so that all information can be included in the printed program.

Howard E. Degler, professor, M. E. University of Texas, chairman, students program committee, Oil-World Exposition

National Oil Scouts to Select 1939 Meeting Place

DALLAS, Tex.—Officers and directors of the National Oil Scouts Association will meet February 11 at the Baker Hotel, at which the time and place of this year's convention will be selected, local members have been informed. Lee A. Adams, Oklahoma City, is president. Other officers are K. B. Foreman, Tyler, and Charles D. Wells, Wichita, Kans., vice presidents; G. R. Kennedy, Kilgore, secretary, and Charles J. Bradley, Tyler, chairman of the executive committee.

Obituaries

JOHN L. EMERSON, 70, oil executive and bank director of Titusville, Pa., died last week in New Orleans.

IRVIN HOLLINGER, 33, of Tulsa, died February 2. He was employed in the land department of Gulf Oil Corp.

J. CHARLES POULTON, 37, of Tyler, Tex., died in Shreveport last week. He was head of the southwestern division of the Deep Rock Oil Corp. and had been with the company 18 years.

H. L. PAYTON, 35, for 10 years an employe of Sun Oil Co., died at Dallas, Tex., last week. He was formerly a pipe line scout for the East Texas district and a member of a geophysical crew in Irion County.

RICHARD CALLINAN, 85, Canada's oldest oil operator and a former associate of John D. Rockefeller, died at Calgary. A native of Cayuga, Ontario, he worked with Mr. Rockefeller in Cleveland some 60 years ago.

WILLIAM P. BRADBURY, 53, vice president and general sales manager of the Consolidated Ashcroft Hancock division of Manning, Maxwell & Moore, Inc., Bridgeport, Conn., died of pneumonia after a six-day illness, recently.

T. P. LEE died in Houston, Tex., February 4. He was born in Petroleum, W. Va., on March 19, 1871. He began work in the oil fields of West Virginia at 16. He moved to Texas in 1903 from Ohio. He first lived at Sour Lake and entered the employ of the Texas Co., where he remained 10 years, advancing to general superintendent of production. He was associated with J. S. Cullinan, Will C. Hogg, James L. Autrey and E. F. Woodward in the organization of the Farmers Petroleum Co., of which he became president. In 1916, Mr. Lee and his associates organized the American Republics Corp., which he served as vice president and director, resigning in 1927. In 1915 he provided capital for the formation of Yount-Lee Co. of Beaumont.

INTERNATIONAL

Mexican Exports Basis of Litigation In New York

Three subsidiaries of the Royal Dutch-Shell group were enjoined in New York federal court last week from interfering with the sale, transportation or delivery of Mexican oil by Eastern States Petroleum Co., Inc., and one of the units countered with a claim for $1,700,000 damages against Eastern States. This litigation divided interest with Washington where Rep. Martin J. Kennedy of New York pressed the State Department for direct answers to questions on the status of negotiations for settlement. In Mexico City President Lazaro Cardenas requested Josephus Daniels, U. S. ambassador to Mexico, to arrange a conference with executives of United States companies whose properties were seized March 18, 1938. A Mexico City newspaper printed a story February 1 reporting settlement of the dispute between the Mexican Government and foreign oil companies, saying the "petroleum question is solved, the Mexican peso will rise and there will be great prosperity." The newspaper story went on to say that the "Government of the United States will buy all our petroleum and with the money derived from its sale will pay indemnities for the expropriated properties."

Executives of companies whose properties were confiscated said such a settlement was out of the question and regarded the report as well as Cardenas' negotiations with Daniels for a conference as "trial balloons." Rumors came from Mexico that President Cardenas was prepared to offer indemnities totaling $50,000,000 for the properties. The estimated value of the United States and British properties seized is between $400,000,000 and $500,000,000.

The injunction obtained from federal Judge Robert P. Patterson in New York by Eastern States Petroleum Co., Inc., prevents Asiatic Petroleum Corp., Anglo-Mexican Petroleum Corp., and Harold Wilkinson, president of both companies, from interfering with the sale, transportation or delivery of Mexican oil by the Eastern States.

The injunction also enjoined the defendants from using "threats or commands" to induce other companies not to buy from the plaintiff. It was made effective pending trial of a suit for $1,500,000 damages brought by Eastern States against the Shell interests, alleging interference with its foreign trade under the Sherman and Clayton antitrust laws.

Immediately after the injunction was signed, Mr. Wilkinson obtained an order from federal Judge Murray Hulbert making Mexican Eagle Oil Co., Ltd., also of the Shell group, a codefendant, and Mexican Eagle filed a counter claim for $1,700,000 damages against Eastern States. It charged Eastern States with unlawfully appropriating 1,700,000 bbls. of oil, valued at $1 a barrel, belonging to Mexican Eagle. With the Shell group charging that Eastern States is selling oil expropriated from Mexican Eagle by the Mexican Government, and with Eastern States contending that none of its oil comes from expropriated wells, Judge Patterson held the American courts were not concerned with this issue, which was for the State Department and the British Foreign Office to handle.

"The defense of unclean hands has not been established," Judge Patterson ruled in granting the injunction to Eastern States.

The complaint said that in August 1938 Eastern States made a contract with the Mexican Government for the purchase of crude oil from Mexican fields on the understanding that only nonexpropriated oil should be delivered under the contract. According to Eastern States, all deliveries to it have been accompanied by certificates from the Mexican Government and from Charles Martin & Co., New York oil inspectors, that the oil is nonexpropriated. Just before the contract was made with the Mexican Government, Eastern States charged, Mr. Wilkinson warned the plaintiff company's officials the Shell group would see that Eastern States was put out of business if it dealt in any Mexican oil, expropriated or nonexpropriated.

It was charged further that subsequently various oil and ship brokers had refused to have further dealings with Eastern States and had attributed this attitude to pressure from the Shell group. A representative of Harris & Dixon, Ltd., of London, testified that Shell interests had induced this concern to break a contract with Eastern States.

Counsel for Shell asserted Eastern States was largely financed by the Mexican Government, which held a $250,000 mortgage on the Houston refinery and had advanced $250,000 in cash for operations and a credit of $500,000 for oil purchases.

Judge Patterson held the defendants had failed to contradict evidence introduced by Eastern States that last November Mr. Wilkinson and the Asiatic and Anglo-Mexican companies, "acting within this country, urged an important customer of the plaintiff to break a contract to purchase the plaintiff's products rather than to incur the enmity of 'the major companies'."

"As to the injury threatened," Judge Patterson said, "the plaintiff has shown a decided falling off in business within the past two months."

Representative Kennedy offered another resolution in Washington February 1 asking the State Department to lay before the House of Representatives its full diplomatic correspondence on Mexican expropriations and Mexico's relations with the Fascist powers and to anwer specific questions on Mexican relations. Included in the scope of the "resolution of inquiry" are questions dealing with Mexican barter arrangements with Germany, Italy and Japan and their implications; the expropriation of all types of properties in which Americans are financially interested, such as railroads and oil, and the activities of the U. S. ambassador to Mexico, Mr. Daniels.

Mexico's crude-oil production for 1938 totaled 38,500,824 bbls., according to a press dispatch from Mexico City last week. No authority was quoted for the production and export figures, but they check fairly close to earlier estimates. The 1938 production was off 17 per cent or 8,401,826 bbls., compared to yield of 46,906,650 bbls. in 1937.

Exports amounted to 14,800,000 bbls. in 1938, against 23,972,483 bbls. in 1937, a drop of 9,172,483 bbls., or 38 per cent.

Increased Output In Germany And Austria

Production of crude oil in Germany, 80 per cent of which is from the Nienhagen field near Hannover, is estimated, for 1938, at 550,000 tons. To this must be added the Austrian production which was 33,000 tons in 1937 and is estimated at 70,000 tons for 1938. The increased output in Germany came from the new field at Reitdebrook where 12 wells from 1,600 to 1,800 meters in depth have been successful in finding oil along an anticline just south of Hamburg. These explorations have been carried out on a fifty-fifty basis between the Prussian State and the Socony-Vacuum Oil Co.

These wells are kept partly closed awaiting construction of plants to take care of the product. At present the oil is sent to refineries at Bremen. An output of 100,000 tons a year is expected from this field. New wells have also been opened just east of Nienhagen field, and in Baden near Worms. Increased output may be made at the Heide field, while Volkenroda and Fallstein are practically exhausted, the others maintaining production.

Production of gasoline from coal in 1937 amounted to 1,100,000 tons. The completion of the new synthetic gasoline plants in the Ruhr district, built largely according to the 18-month plan which ended December 30, 1938, should give an additional capacity of about 600,000 tons of synthetic gasoline. About half of these plants are to use the Fischer-Tropsch process and half the I. G. Hochdruck process.

The production of motor fuels from domestic sources in 1937 in metric tons was as follows:

Synthetic gasoline	1,100,000
Benzol	450,000
Alcohol	180,000
Gasoline from domestic crude oil	45,000
Distillate from brown coal tar	30,000
Total	1,805,000

The production of domestic motor fuels in 1938 may reach 1,900,000 tons. In 1939 it should reach a total of 2,500,000 tons for light motor fuel, or about 50 per cent of normal consumption requirements.

It is stated that refinery capacities for imported oil have not and will not be increased; and that Germany's increased requirements must be produced from domestic sources. Imports of crude oil have increased from 538,000 metric tons in 1936 to 722,000 tons in 1937. Also Germany's net imports of petroleum products excluding crude oil have averaged about 3 million tons in 1936 and 1937.

The total apparent consumption of petroleum products and motor fuels in Germany is about 5,600,000 tons and of former Austria about 400,000 tons.

Natural Gas News

Federal Power Commission Rejects Coal Effort

WASHINGTON, D. C.—The Federal Power Commission has been asked by the coal industry to consider the effect of sales of natural gas. Representative Dirksen, of Illinois, member of the House appropriations subcommittee, interrogated Acting Chairman Seavey of the Power Commission on the subject but was told the commission had no jurisdiction.

Discussing the competition, Dirksen said:

"I cite, for instance, the pipe lines now going from Amarillo, Tex., to St. Louis and Detroit, the pipe lines running through the State of Illinois, the increased distribution of natural gas there and the resultant diminution in the number of miners engaged in the bituminous coal industry in the state, which has dropped from approximately 103,000 to 40,000."

"We have no jurisdiction over the certificate of convenience and necessity unless the proposed line invades the marketing area of an existing line," Seavey replied.

Dirksen said there was a question "that is ultimately going to be fought out, and that is to what extent will a state be empowered to impose a tax upon gas that is transported into the state from another field."

"And they are going to make that effort through their legislatures very soon." he told Seavey.

Seavey said it was a matter over which the commission had no jurisdiction.

Texas Challenges Kansas Gas Proration Restrictions

WICHITA, Kans.—Republic Natural Gas Co. has filed in federal District Court an action which challenges constitutionality of gas proration in Kansas. In its action the company, a Delaware corporation, made the Kansas Corporation Commission and its conservation officers defendants, alleging that enforcement of the proration orders for the Hugoton field would cause a company loss of $210,000 annually, limiting it to production of "approximately 55 per cent of its market requirements."

New Jersey Standard Not Divesting Gas Interest

Standard Oil Co. of New Jersey has filed claims of unconditional exemption from the Public Utility Holding Company Act with the Securities and Exchange Commission, indicating the concern has no intention of disposing of its natural gas utility connections.

Rumors that Standard of New Jersey would dispose of its natural-gas utility companies to meet terms of the act requiring dissolution of holding companies have developed from time to time. The Securities and Exchange Commission has granted a temporary stay of execution. Since natural gas is inseparable from the production and development of oil, and since none of the securities of the gas companies is in the hands of the public, there is the possibility the S.E.C. will not order Standard of New Jersey to divest itself, at least in the immediate future, of its natural gas properties which have been developed simultaneously with its oil operations.

Colorado Gas Companies Test Federal Power Authority

WASHINGTON, D. C.—Two gas companies have denied the Federal Power Commission had jurisdiction to rule on a complaint by Denver, Colo., against rates which the city contended were unjust.

The firms asserted also that Denver previously had approved the rate, that they spent $20,000,000 making arrangements to deliver the gas in accordance with an existing contract, and that Denver "in equity and good conscience is stopped from now questioning the legality" of the rate.

Counsel for Denver asserted the Colorado Interstate Gas Co. charged the Public Service Co. of Colorado a discriminatory rate.

Colorado Interstate and the Canadian River Gas Co., in their reply, asked dismissal of the complaint on the ground the commission had no jurisdiction over the production, transportation, or sale of natural gas produced by Canadian River and sold by Colorado Interstate to the Public Service Co. of Colorado for resale to Denver consumers.

The commission said natural gas distributed by the Public Service Co. of Colorado is obtained from Colorado Interstate and is transported through an interstate pipe line from Clayton, N. M., where Canadian River transports gas through an interstate pipe line from Texas.

Set 120-Day Production Orders on Sour Gas

AUSTIN, Tex.—The Texas Railroad Commission has inaugurated a policy of 120-day production orders

Pipe Line Activity

United Gas Pipe Line Seeks Recovery of State Taxes

NEW ORLEANS, La.—Attacking validity of Act 203 of the 1936 Louisiana Legislature, United Gas Pipe Line Co. of Delaware has filed action in federal court seeking recovery of $67,750 in state taxes paid under protest and asks that the act be adjudged unconstitutional. It charged that natural gas taxes authorized by the act are not applicable to gas sold to other companies for resale.

North Permian Basin Fields To Obtain New Outlets

MIDLAND, Tex.,—Relief of pipe line congestion in the North Permian Basin area which has brought about pipe line proration in the past two weeks is promised in the near future. Shell Pipe Line Co. is now surveying for an 8-inch line from the Bennett and Wasson pools of Yoakum and Gaines counties to its 8-inch terminal at Hobbs, N. M. The project will involve the laying of a large gathering system in the two fields and some 30 to 35 miles of main line.

Humble Pipe Line Co., at present the sole outlet for the six North Permian fields, operates a 12-inch line from Wasson-Bennett to Hobbs. Since the two fields' allowable, plus that trucked in from the Seminole, Slaughter, Duggan and West fields, was some 2,000 bbls. over the line's capacity Humble was forced to restrict its take to only 85 per cent of the six fields' production. The company's announcement, which was effective January 20, also stated it would not provide connections to new completions unless the wells were drilled to fulfill lease obligations.

Hope for another outlet is offered by Aloco Oil Co.'s plan to construct a 6-inch line from the Yoakum and Gaines County fields southward through the Seminole field of central Gaines. From Seminole the line would then run southwest to tie in with Atlantic Pipe Line Co.'s 8-inch line running from Hobbs to Midland at a point where the Atlantic line cuts across the southwest corner of Gaines County. Laying of this line is contingent upon Aloco taking over producing and undeveloped leases owned by the Texas Co. in Yoakum County.

A north outlet for the northern tier of pools may soon be offered if a refinery now planned for Levelland, Hockley County, is built.

River crossing on California natural gas line

Jack County Gathering Line Planned by Burk Co.

FORT WORTH, Tex.—Burk Royalty Co. has taken over connections of 73 wells on 29 leases in Jack County, producing approximately 1,000 bbls. daily, formerly connected to the pipe line of Continental Oil Co., George T. Kimbell, president, announced.

The Burk company will construct a pipe line from the main gathering lines to the Texas Pipe Line Co. station at Bryson, a distance of 3 miles. Part of the oil will be shipped through the Texas line to the refinery of the Burk company at Dallas, and balance to a Bryson refinery, another unit of Burk Royalty Co.

Mo.-Kan. Pipe Line Distribution of Panhandle Eastern Stock

Receivers of Missouri-Kansas Pipe Line Co. have been authorized to exercise a warrant for the purchase of 80,000 shares of stock of Panhandle Eastern Pipe Line Co. and to distribute the subscription rights among the stockholders prorata. An exception provided that each Class B share shall be entitled to one-twentieth of the right accorded each share of common stock and that treasury stock of Missouri-Kansas shall not be recognized in the distribution.

Kentucky-Indiana Gas Line Permit Applied For

General Pipe Line Corp., Indianapolis, Ind., has applied for a certificate from the Federal Power Commission to construct a 20-inch gas line from gas fields in Kentucky to Indiana. The gas would be for sale to industrial concerns and public utilities. It would be approximately 180 miles long with approximately 40 miles of 3-, 4-, 6-, and 8-inch gathering lines. A War Department permit has been obtained for construction of a double pipe line crossing under the Ohio River near Louisville, Ky.

for the sour gas area of the Panhandle field of Northwest Texas.

It set a daily allowable of 680,000,000 cu. ft. effective from February 1 to June 1. The order followed hearings in Amarillo and Austin at which some operators, cited for overproduction of monthly allowables, sought orders on a seasonal basis in order to properly anticipate changes in market demand.

Charges that sour gas operators have overproduced for five months were studied by the commission with the possibility court action may be instituted.

Commission engineers explained that some wells were overproduced to compensate for underproduction from other wells on the same lease; a technical violation. Whether this should be penalized is the question. Theoretically, under sour gas proration, no well should be given an allowable greater than it can produce and the market is supposed to be divided among all wells. If allowables which are too high are given some wells, other wells in the field must suffer.

Install Gas Treater

The Sun Oil Co. has entered into an agreement with the Girdler Corp., for the installation of a Girbotol gas purification plant at its Marcus Hook, Pa., refinery. Eleven million cubic feet per day of refinery gas will be treated for the removal of hydrogen sulfide.

Natural Gasoline

California Natural Gasoline Stocks Show Small Decline

Production of natural gasoline in California plants during December fell a little under demand for the month and stocks declined slightly.

NATURAL GASOLINE PRODUCTION BY FIELDS
DECEMBER, 1938

Field—	Gas treated (thousands cu. ft.)	Natural gasoline produced (gallons)
San Joaquin Valley:		
Belridge	3,379,642	1,866,813
Elk Hills	50,487	109,229
Kettleman Hills	10,853,925	15,873,490
Midway-Sunset	984,263	1,960,804
Mountain View	227,377	324,310
Miscellaneous	827,748	525,113
Coastal district:		
Elwood	454,511	657,541
Rincon	165,500	213,845
Santa Maria	125,874	386,302
Ventura Avenue	3,699,589	5,253,265
Miscellaneous	480,999	469,185
Los Angeles Basin:		
Brea-Olinda Coyote	490,640	1,288,754
Dominguez	1,618,570	2,971,325
El Segundo	153,185	312,322
Huntington Beach	1,062,542	3,472,939
Inglewood	265,477	353,657
Long Beach	2,366,716	7,838,697
Montebello	752,534	919,437
Richfield	315,578	661,136
Rosecrans	773,880	950,970
Santa Fe Springs	1,499,749	5,044,006
Seal Beach	411,495	497,803
Torrance	533,590	976,340
Miscellaneous	1,295,789	2,529,766
Total (all fields)	32,839,660	55,457,049

Distribution

	Gallons	Gallons
Stocks, beginning of month	2,544,731	
Production during month	55,457,049	
Delivered to refineries		54,712,275
Delivered to jobbers, brokers and blenders		727,675
Blended at plants for production of motor fuel		10,005
Losses		27,818
Stocks, end of month		2,524,007
Total	58,001,780	58,001,780

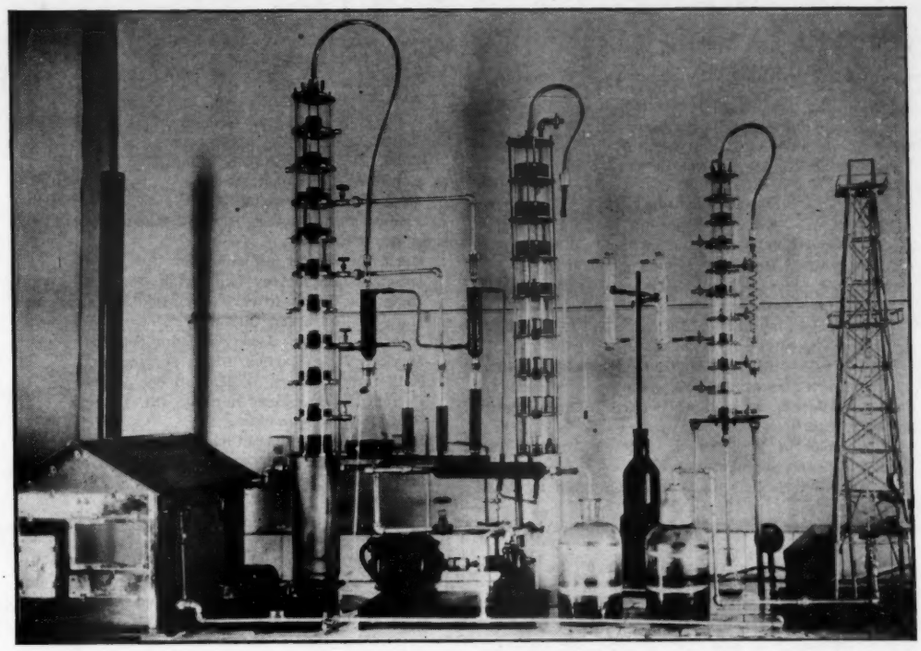
	Gallons	Barrels
Liquefied petroleum gas production	2,502,484	59,583
Motor fuel produced	10,240	244

DISTRIBUTION OF LIQUEFIED PETROLEUM GASES
DECEMBER, 1938

(Thousands of gallons)

Number of producing companies		12
Stocks beginning of month		1,641
Production during month:		
At natural gasoline plants	2,502	
At refineries from nat. gas.	759	
At refineries from cracked gas.	1,069	
Total		4,330
Total demand		4,325
Losses		135
Stocks end of month		1,511
Total	5,971	5,971

Refinery Expansion



Complete glass model refinery capable of fractionating crude oil into 11 products. Now in use at the chemical engineering department of the University of Nebraska

To Start Inland Empire Plant Late in February

The Spokane, Wash., refinery being constructed by Inland Empire Refineries, Inc., is expected to be ready for operation about February 15. Cut Bank field operators will furnish crude for the operation of the Spokane plant.

Glacier Production Co. has contracted with Inland Empire Refineries to furnish 144,231 bbls. of crude for $150,000 or a price of $1.04 per barrel for the initial operation, and has also signed a 10-year contract to furnish crude to the refinery, under specific minimum and maximum requirements, at a price delivered 20 cents under the Mid-Continent price for the balance of 1939; 15 cents under Mid-Continent posted rates for 1940 and 5 cents under the same basic price for the remainder of the contract.

The company announced that these price concessions were made to the refinery operators to obtain an immediate outlet for crude from the Clacier properties in the Cut Bank field and to stabilize royalty returns to investors in the company.

Treatment of Polymerized Gas on W.P.R.A. Program

Treatment of polymerized gasoline for the removal of gums and the addition of inhibitors to stabilize the color of gasoline have been added to the subjects for discussion on the technical program at the annual meeting of the Western Petroleum Refiners Association at San Antonio, Tex., March 20-22.

With the development of polymerization as a method of processing gases into higher octane gasoline and increasing the yield of each barrel of crude oil, new methods of eliminating gums were necessary. Petroleum chemists have discovered inhibitors which are highly successful in solving the problem and their uses will be discussed by W. B. Ross, chemist of the Pure Oil Co., Chicago.

Another subject of extreme interest to the Mid-Continent refiner will be that of catalytic refining, reforming and polymerization in plants designed for the smaller operator. That subject will be presented by Wright W. Gary, of the M. W. Kellogg Co., New York.

Two other papers will be presented in the technical sessions and the program for the general sessions will be completed soon, A. V. Bourque, secretary-treasurer, has announced. Visits to Randolph field, the "West Point of the Air," where army flyers receive their preliminary training and a tour of the ancient missions of San Antonio are on the entertainment program of the meeting.

New Montana Refinery

Glacier Production Co. has placed orders for materials for its 1,500-bbl. refinery to be erected at Cut Bank adjoining its absorption plant. Grading of the site has been completed. Equipment will include a Dubbs cracking unit. The company has all production in Cut Bank and has three strings of tools running there. Its wells had been shut in but last November it began moving crude to the new Inland Empire Refineries, Inc., at Spokane, Wash., in which it has a financial interest and during the month it had around 25 wells on production. It also has considerable storage facilities in the field. The company is a subsidiary of the Montana Power Co.

Dismantle Valvoline Refinery

Valvoline Oil Co.'s lubricating oil and wax refinery at Warren, Pa., a plant on the idle list for the past four years, has been sold to Rupert & Wayland of Pittsburgh. Dismantling operations will start within 30 days. The plant has a rated capacity of 1,000 bbls. per day. The Valvoline refinery at Butler, Pa., and compounding plant at Franklin are not affected by the sale.

Propose Montana Plant

SHELBY, Mont.—Negotiations are in progress for the construction of a 2,000-bbl. refinery here. Socony-Vacuum Oil Co. and the Producers Refining Co. representatives have been working with oil producers throughout the local and Cut Bank fields for the purpose of ascertaining the extent of crude supplies.

Programs and Meetings

A.I.M.E. Annual Meeting
Program February 13-16

Petroleum engineers from all parts of the world will gather in New York next week for the annual meeting of the American Institute of Mining and Metallurgical Engineers, February 13 to 16.

Tuesday, February 14

9:15 a.m.—Production Engineering in Foreign Fields—George B. Corless, chairman; Benjamin C. Craft and M. L. Haider, vice chairmen.

"Some Aspects of Mud Technique in Iran," M. W. Strong, Anglo-Iranian Oil Co.

"Multistage Stabilization of Crude Oil," H. S. Gibson, Anglo-Iranian Oil Co.

"Air-Conditioning as Applied to Oil Field Buildings in Tropical Climates," O. W. Johnson, Standard Oil Co. of California, and T. A. Pollard, Bahrein Petroleum Co., Ltd.

"Principles of Well-Spacing," Morris Muskat, Gulf Research & Development Co.

2 p.m.—W. H. Geis, chairman; Benjamin C. Craft, vice chairman.

"The Turner Valley Field," Vernon Taylor, Imperial Oil, Ltd.

"Drilling for Oil on the Headwaters of the Amazon in Eastern Peru," (motion pictures), J. E. Brantly, Drilling and Exploration Co., Inc.

"Exploring Drill Holes by Sample-Taking Bullets," Eugene G. Leonardon and D. C. McCann, Schlumberger Well Surveying Corp.

"Economic Aspects of Oil Field Exploitation in Colombia." Motion picture, "An Air Trip to the Oil Fields of Colombia," E. Ospina Racines, first vice consul of Colombia in charge of petroleum affairs in New York.

"The Treatment of Coal With Oil and Other Petroleum Products," J. M. Pilcher and Ralph A. Sherman, Battelle Memorial Institute.

Wednesday, February 15

9:15 a.m.—Symposium on Oil Production, Foreign and Domestic—J. Terry Duce, chairman.

Argentina, Mario L. Villa, Y.P.F.

Australia, W. G. Woolnough, Commonwealth Govt.

Bahrein, J. O. Nomland.

Bolivia, J. M. Reyes, Y.P.F.B.

Burma, L. D. Stamp, Univ. of London.

Canada, G. S. Hume, Geol. Surv. of Canada.

Colombia, O. C. Wheeler, Internatl. Petroleum Co.

Cuba, Roy E. Dickerson, Atlantic Refining Co.

Ecuador, E. Escobar, P.

Egypt, Geol. Survey of Egypt.

France and Colonies, H. de Cizancourt, Cia. Francaise des Petroles.

Germany, Walter Kauenhowen.

Great Britain, D'Arcy Exploration Co.

India: See Burma (covers 1937), Geol. Surv. of India.

Iran, Anglo-Iranian Oil Co.

Iraq, B. B. Cox, Socony-Vacuum Oil Co.

Mexico, V. R. Garfias, Cities Service Co.

Netherlands Indies, B. H. Van der Linden.

Peru, O. B. Hopkins, Imperial Oil, Ltd.

Poland, C. Bohdanowicz.

Russia, B. B. Zavoico, Chase National Bank.

Trinidad, P. E. T. O'Connor, Antilles Petroleum Co. (Trinidad), Ltd.

Domestic:

Colorado, C. E. Shoenfelt, Petroleum Information, Inc.

Kentucky, Coleman D. Hunter, Kentucky-West Virginia Gas Co., and Iley B. Browning, geol. and operator.

Montana, Eugene S. Perry, Montana School Mines.

Ohio, DeWitt T. Ring, Ohio Fuel Gas Co.

Tennessee, Kendall E. Born, Tenn. Div. Geol.

West Virginia, David B. Reger, cons. geol.

2:00 p.m.—Domestic (continued):

South Arkansas, W. B. Weeks, Phillips Petroleum Co.

California, V. H. Wilhelm, Texas Co.

Illinois, A. H. Bell, Ill. State Geol. Surv.

Indiana, M. M. Fidlar, state gas supervisor.

Kansas, W. A. ver Wiebe, Univ. of Wichita, and E. G. Dahlgren, Conservation Div., Kansas.

North Louisiana, H. K. Shearer, Hunter Co.

South Louisiana, R. D. Sprague, Sinclair Prairie Oil Co., and C. B. Richardson, Barnsdall Oil Co.

Mississippi, H. M. Morse, state oil and gas supervisor.

Michigan, Theron Wasson, Pure Oil Co.

Missouri, Frank C. Greene, Mo. Geol. Surv.

New York, D. H. Newland, state geol.

Oklahoma, H. E. Rorschach, cons. eng.

North and Central Pennsylvania, Arthur C. Simmons, geol. and petrol. eng.

South Pennsylvania, John T. Galey, operator.

East Texas, D. V. Carter, Magnolia Petroleum Co.

Texas Gulf Coast, E. P. Hayes and J. K. Butler, Texas Co.

North Texas, H. B. Fuqua and B. E. Thompson, Gulf Oil Corp.

North Central Texas, H. W. Imholz, cons. geol.

Texas Panhandle, Henry Rogatz, cons. geol.

Fault Zone of South Central Texas, Joseph M. Dawson, Gulf Production Co.

South Texas, M. T. Halbouty, Merit Oil Corp.

West Texas, Peter P. Gregory, Yates Pool Engng. Com.; E. W. Owen, geol., L. H. Wentz (oil division), and John G. H. Crump, Chase National Bank.

Utah, C. E. Shoenfelt, Petroleum Information, Inc.

Wyoming, E. W. Krampert, cons. geol.

Thursday, February 16

9:15 a.m.—Economics—Sidney A. Swensrud, chairman; Joseph E. Pogue, vice chairman.

"A Design for More Effective Proration," Joseph E. Pogue, Chase National Bank.

"Status and Outlook of Petroleum Supply, Demand, and Stocks," Fred Van Covern, A.P.I.

"The Economic Significance of Overdevelopment," John D. Gill, Atlantic Refining Co.

"Economic Equilibrium in Petroleum Refining." Norman D. Fitzgerald, Chase National Bank.

"World Consumption of Petroleum and Related Fields During 1938," V. R. Garfias, R. V. Whetsel and J. W. Ristori, Cities Service Co.

"An Administrator's Views on Proration," Ernest Thompson, Texas Railroad Commission.

6 p.m.—Petroleum Division Dinner—George B. Corless, chairman, Petroleum Division, presiding.

After-dinner talk, "Some Current Problems in Oil Conservation," by Harry Carothers Wiess, president, Humble Oil & Refining Co.

CALENDAR

February

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Engineering Societies Building, New York, Feb. 13-16.

LIQUEFIED PETROLEUM GAS ASSOCIATION, INC., annual meeting, Hotel Biltmore, Oklahoma City, Okla., February 20-22.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS AND LOUISIANA ENGINEERING SOCIETY, joint meeting, St. Charles Hotel, New Orleans, La., Feb. 23-25.

NORTH TEXAS OIL AND GAS ASSOCIATION, annual meeting, Wichita Falls, Tex., Feb. 25.

NATIONAL ASPHALT CONFERENCE, Los Angeles, Calif., week of February 27.

March

AMERICAN SOCIETY FOR TESTING MATERIALS, committee week and regional meeting, Deshler-Wallick Hotel, Columbus, Ohio, Mar. 6-10.

INTERNATIONAL ACETYLENE ASSOCIATION, 39th annual convention, Houston, Tex., Mar. 8-10.

WELDING CONFERENCE AND SHORT COURSE, University of Oklahoma, Norman, Okla., Mar. 9-10.

AMERICAN PETROLEUM INSTITUTE, spring meeting of Southwestern District Division of Production, Plaza Hotel, San Antonio, Tex., Mar. 16-17.

WESTERN PETROLEUM REFINERS ASSOCIATION, annual meeting, San Antonio, Tex., Plaza Hotel, Mar. 20-22.

SOCIETY OF EXPLORATION GEOPHYSICISTS, annual meeting (joint meeting with A.A.P.G. March 22), Oklahoma City, Huckins Hotel, March 21-23.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, 24th annual meeting, Skirvin Hotel, Oklahoma City, Okla., Mar. 22-24.

April

AMERICAN CHEMICAL SOCIETY, Baltimore, Md., April 3-7.

AMERICAN PETROLEUM INSTITUTE, spring meeting of eastern district, Division of Production, William Penn Hotel, Pittsburgh, Pa., April 4-5.

AMERICAN PETROLEUM INSTITUTE, spring meeting of Pacific Coast district, Division of Production, Biltmore Hotel, Los Angeles, Calif., April 11.

NATIONAL PETROLEUM ASSOCIATION, semi-annual meeting, Hotel Cleveland, Cleveland, Ohio, April 13-14.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Mid-Continent district, Skirvin Hotel, Oklahoma City, Okla., April 18-19.

OIL-WORLD EXPOSITION, Houston, Tex., April 24-29.

May

PETROLEUM ELECTRICAL SUPPLY ASSOCIATION AND PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Rice Hotel, Houston, Tex., May 2-4.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Hotel Tulsa, Tulsa, Okla., May 3-4-5.

AMERICAN PETROLEUM INSTITUTE, ninth midyear meeting, Roosevelt Hotel, New Orleans, La., May 15-18.

NATURAL GAS SECTION, A.G.A., annual meeting, Tulsa, May 8-11.

WORLD AUTOMOTIVE ENGINEERING CONGRESS, sponsored by S.A.E. for New York (May 22-26), Indianapolis (May 20), Detroit (May 31-June 2), San Francisco (June 6-8), May 22-June 8.

NATIONAL ASSOCIATION OF PURCHASING AGENTS, annual convention (Oil Company Buyers' Group), Fairmont Hotel, San Francisco, Calif., May 21-25.

June

PENNSYLVANIA GRADE CRUDE OIL ASSOCIATION, Hotel Hershey, Hershey, Pa., June 15-16.

THIRTEENTH INTERNATIONAL CONGRESS OF CARBIDE, ACETYLENE, OXYACETYLENE WELDING AND ALLIED INDUSTRIES, Munich, Germany, June 25-July 1.

ENGINEERING and OPERATING

In This Issue

MECHANICAL AND STEAM DRILLING RIGS USED IN ZENITH, KANSAS
By Harry F. Simons ..... *Page 42*

At the present time the Misener sand development in the Zenith, Kansas, field is occupying more rotary and cable-tool drilling rigs than any spot in the state. Both steam and mechanical rigs are being used as there is plenty of fresh water at shallow depths.

CHEMISTRY OF LUBRICATING OILS FOR USE IN AIRCRAFT ENGINES
By G. M. Larson ..... *Page 46*

The lubrication of aircraft engines of different makes and service requires a study of the chemical reactions of oils in addition to determining the physical characteristics. Some engine manufacturers approve straight mineral oils and others require additives.

SAFETY—FOOT GUARD ON ROTARY TABLE ..... *Page 48*

Improvement in the design of rotary drawworks speeds up the hoisting procedure and the elevators are sometimes in position for latching on the pipe before the rotary table has stopped turning from breaking out the previous stand. A guard over the outer edge of the table prevents the workmen from being injured.

BENEFITS OF CONSERVATION PRACTICES IN CONROE, TEXAS, OIL FIELD
By A. S. Parks ..... *Page 50*

The Conroe field was discovered seven years ago and enjoyed an orderly development from which it is now reaping the benefits. The average gas-oil ratio for the field to date is 600 cu. ft. per barrel, a decline of only 2 pounds pressure per 1,000,000 bbls. withdrawal.

DESIGN OF A RECENTLY INSTALLED FILTROL FRACTIONATION PLANT
By M. M. Moore and H. M. Gwyn ..... *Page 59*

A recently installed plant combines fractional distillation and contact clay decolorization into a single and continuous process by injecting finely divided bleaching clay into the hydrocarbon oil stream as it goes to the fractional distillation unit.

TECHNICAL CONTROL REQUIRED IN THE MANUFACTURING OF GREASES
By W. A. Lutz, H. A. Ambrose, and W. A. Gruse ..... *Page 62*

First half of a paper presented before the National Lubricating Grease Institute discussing basic conditions and structure of greases.

OPERATING IDEAS ..... *Page 45*

METALS PROGRESS—*By W. L. Nelson* ..... *Page 56*

QUESTIONS ON TECHNOLOGY—*By C. K. Francis, Ph.D.* ..... *Page 69*

PROBLEMS FROM READERS—*By L. G. E. Bignell* ..... *Page 70*

Rotaries and Cable Tools Developing New Zenith,

(Upper) Well head on the east side of the Zenith, Kansas, field. Note that this well is equipped with 3-inch upset tubing. (Center) Building a foundation for a pumping unit on a well that is still flowing. (Lower) This well refused to flow for its potential, but after being pumped for a short time it resumed flowing. There are no rods in the well

By HARRY F. SIMONS

With 97 producing wells, a January allowable of 67,342 bbls., and 21 active operations, the Zenith, Kansas, field, in Sections 11, 13, 14, 23, 24, and 26-24s-11w, is the most active spot in Kansas. Ten of the 13 rotary drilling rigs in the area are at work at the present time, and derricks are being built for nine locations, assuring continuance of the drilling campaign for some time. Three of the six cable-tool rigs are occupied with completions, and work is in view for those that are temporarily on the rack.

The low allowables due to the state proration caused by an unsatisfactory market demand sets hard on the Zenith pool, as its allowable for January was only 0.86 per cent, the second lowest per cent allowable in the state, the Habiger-Lansing-Kansas City lime pool in Rice County being the lowest with 0.72 per cent. The potential for the Zenith pool was 208,236 bbls. daily on January 1, 1939; 11 wells were added or had their potentials revised during December, 1938. Despite the stringent proration the Zenith pool has progressed rapidly principally because it has an outlet for its production through the Stanolind Pipe Line Co.

Production in the field is from the Misener sand found from 3,737 to 3,808 feet; the pay zone averages about 15 feet in thickness, but a producing thickness of 27 feet was recorded in one well on the east side of the pool. Stanolind Oil & Gas Co. discovered the field in September, 1937, when it completed its No. 1 Mary Hartnett, in the NW NW SE of Section 23-24s-11w, for 974 bbls. of 41-gravity oil. The Hartnett well was located by seismograph survey, which showed a structure existing in the lower formations. The Misener generally occurs as a local feature through Kansas; some of the dry holes in the Zenith field missed the sand altogether.

Extent of the Misener sand body is partially known on the south, north, and west and was recently defined on the eastern side. The formation dips to the south at the rate of about 15 feet to the mile, the northernmost well, the No. 1 Glasscock of the Stanolind company in the SW SW NE of Section 11-24s-11w, producing from a total depth of 3,756 feet, while the Stanolind and others No. 1 Paulsen in the NW NW NE of Section 26-24s-11w is bottomed at 3,810 feet. Two locations to the south, Stanolind drilled the No. 1 F. Paulsen to a total depth of 4,020 feet and got a dry hole. Deepest producer on the west flank is the No. 1 Ferris of Stanolind in the SE SE SE of Section 15-24s-11w, while the deepest producer on the east is the E. H. Moore and others No. 4 O'Haver, NE SW SE Section 13-24s-11w, bottomed at 3,819 feet. It also has the largest potential in the field. Most recent failure in the area, and one which gives some indication of the eastern boundary, was the E. H. Moore No. 1 Wallace, NW NW NE of Section 24-24s-11w, which was dry at a total depth of 3,812 feet.

Most of the wells flow on completion with a bottom-hole pressure of from 1,200 to 1,300 pounds per square inch. Some are shot on completion but generally this practice is not followed due to danger of damage to the pipe which is set in the top of the sand. In case a shot is used sand-tamping is generally used as one water-tamped shot damaged the casing seat on the well.

Drilling

The Zenith field differs from many other Kansas fields in that there is plenty of fresh water available for use in boilers at depths above 120 feet and the drilling is not limited to mechanical rotary rigs. There are two steam rotaries at work in the field at the present time both of which are semimodern. Two boilers are used for generating steam, a superheat pump is used for the water feed and a water-softener removes any scale forming ingredients from the water. Wells in the field make little gas and the boilers are fired with fuel oil through special spray type burners; a regular duck's nest is used for a target.

Both of the steam rigs have rotary tables that are independently driven by 7 by 7½-inch twin-cylinder steam engines. Instead of the usual duplex steam pump these rigs use vertical steam engines to drive a 7¼ by 14-inch gear-driven pump. These pumps maintain a fluid pressure of approximately 650 pounds per square inch on the 5⅜-inch drill pipe. The hoists are driven by 12 by 12-inch, semi-enclosed, twin-cylinder engines.

The mechanical rigs in use vary in design and size of hoists, pumps, and engines. Several of them drive through transmissions without reversible clutches, while others use a reversible clutch. Most of them are arranged with the engines in series so they can be compounded on either the pump or drawworks. Gear-driven pumps generally have a 14-inch stroke with 6¾ liners being used when drilling with the 4½-inch drill pipe. On that size pipe these pumps maintain a pressure of from 600 to 650 pounds per square inch. Prime movers vary from 160

Are Active in Kansas Pool

to 180 hp. in size, with some of them using butane, while others use Diesel fuel. One gasoline rig is at work in the field.

Derrick equipment is generally modern with most of the crown and traveling blocks being of the heavy roller-bearing type; 1-inch and 1⅛-inch drilling lines are used. The derricks are mostly 96-foot structures on which Range 2 pipes may be pulled in doubles but some dericks are 126 feet, allowing the pulling of the pipe in thribbles.

Two steam and one mechanical cable-tool rigs are in use at present for completion work. The mechanical rigs use a twin-cylinder, horizontal Diesel engine which drives the bandwheel through a counter-shaft. Steel rig fronts are used for wheel, beam and posts and a minimum of rigging-up time is required.

Hole Sizes

Following are the contractors and oil companies having rotary rigs at work in the Zenith field: Hissom & Wolfe Drilling Co., Zephyr Drilling Co., J. E. Mabee, Inc., Creekmore Drilling Co., J. E. Crosbie, Inc., Simpson & Noble Drilling Co., Big West Drilling Co. and Leslie Fain Drilling Co. Zephyr, Creekmore, Crosbie, Fain, Simpson & Noble and Big West have cable-tool rigs at work or stacked in the field.

From 14 to 16 days are required to drill the rotary hole from under the surface pipe to the casing point with from 10 to 12 bits being used. Rigs using 5-$\frac{5}{8}$-inch pipe generally drill a 9⅞-inch hole while those using 4½-inch pipe drill a 9-inch hole. For a time some contractors were drilling 11¼-inch holes but this size was too large to be practical when running 7-inch casing.

Practice in the field is to drill a 14-inch hole to approximately 250 feet and run 10¾-inch casing and cement it with from 200 to 250 sacks of cement. This surface string seals off the fresh water sands and prevents their being contaminated. The surface hole is drilled with one bit at the present time but previously a 9-inch bit was used and the hole reamed to the larger size with a 14-inch pilot bit. Most contractors have from 8 to 10 joints of 6-inch drill pipe to provide weight while drilling the upper hole.

All of the drilling under the surface pipe is with rock bits most of the formations being comparatively hard. The first hard streak occurs around 1,750 feet, but the hardest drilling is encountered in the Kansas City lime through which bits average about 100 feet. It is at the base of the Pennsylvanian and is found between 3,450 and 3,550 feet, depending on the location in the field. The Chester lime and the chat are also quite slow drilling, but the formations soften from 150 to 200 feet above the pay. Table 1 is based on bit performance on several wells which were drilled with a 9-inch bit and 4½-inch drill pipe with a 30-foot drill collar.

While drilling to 2,500 feet is accomplished quickly, the boring operation slows down considerably after that. There are a few soft spots after that depth and the general run of formations are comparatively slow drilling. Unusual features disclosed by examination of the bit records are the slow rate of rotation and the amount of weight carried on the bit.

There is little difficulty in keeping the hole straight and hence little danger of crooking the hole due to overweight; from 20,000 to 25,000 pounds bit weight is commonly used. Drilling crews learned from experience that rapid rotation caused many failures in the drill pipe, and the drilling rate was not increased appreciably by greater rotary speeds. On rigs equipped with rotaries that will turn as high as 350 r.p.m., the speed rarely exceeds 100 r.p.m., and this speed is only used when starting the hole. The bits are also left in the hole longer, the shortest average run being 19.5 hours, and this was reduced by a bit that was pulled prematurely. Bits pulled after 25 hours' running at the above speed and weight have been found to be dull, although the bearings were not appreciably damaged, and there was not apparent tendency of the bits to wear on the outer cutting edge except in cases where a sharp sand was encountered.

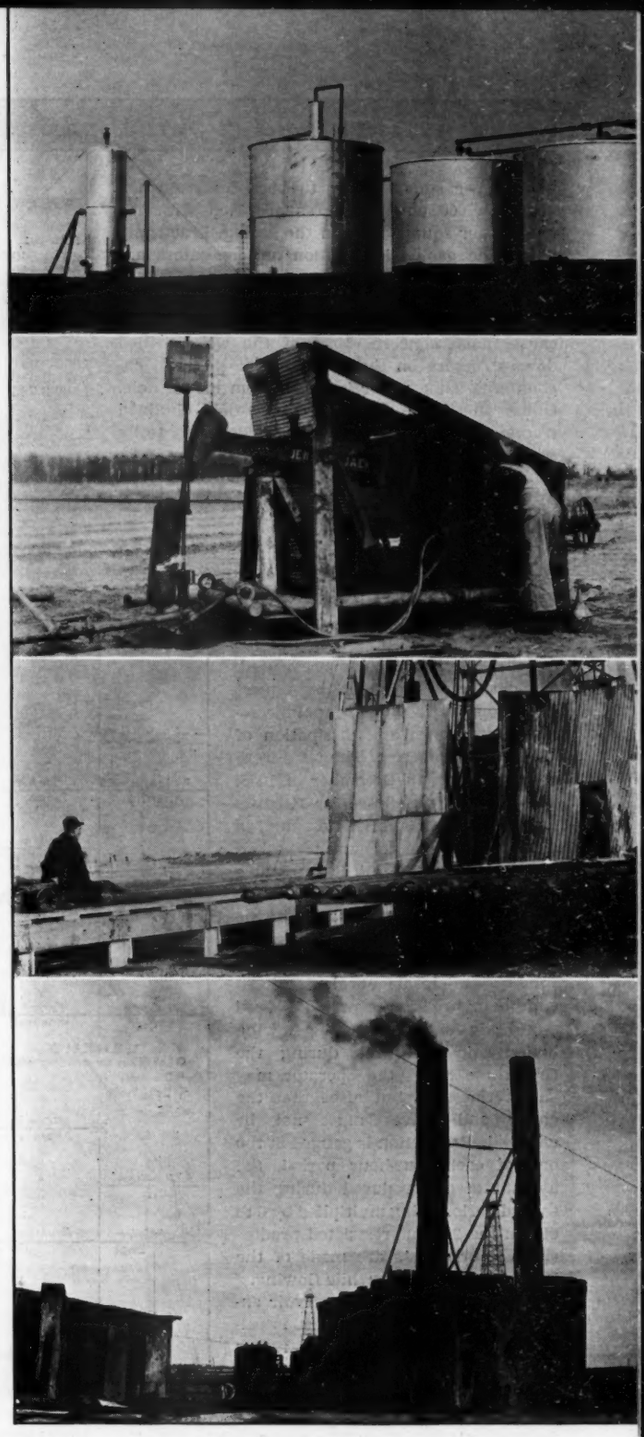
There are not many mud problems to bother the drilling crews, the major one being a diminished return of drilling fluid just below 2,500 feet. Some artificial materials are added to raise the viscosity, but the most successful remedy has been the addition of fibered material to seal off the formations. Some lime is added to the mud at about 1,000 feet to counteract the salt strata encountered from 1,040 to 1,050 feet. The salt veins are thin compared to some parts of Kansas, and are generally disregarded. When it comes time to core, the mud generally weighs from 10.2 to 10.5 pounds per gallon, with a viscosity of from 38 to 40.

Nearly all of the wells are cored before running the casing, although a few cores were missed, as the dip of the formations was underestimated at first and a few wells were too deep into the pay to risk coring.

Two types of completions have been used in the Zenith field, cable tools and rotary. The cable-tool rig is moved in while waiting for the cement to set, the mud is bailed from the casing and then the hole filled with oil. The plug is then drilled and if a lime section is present above the sand, it is acidized and tested for production; the sand is then drilled and the casing swabbed to induce flowing. If, after a test, a shot is believed advisable, from 10 to 20 quarts are used. The effects of the shots have not been beneficial enough to justify shooting in most cases.

Several wells have been completed by the rotary method but this practice has not been wholly successful. The procedure is to core through the Misener into the top of the Viola and then ream the hole to the casing point; a 6¼-inch rock bit is run in the hole on 3½-inch drill pipe and the mud displaced with water. The plug is drilled and water circulated until the hole is clean, after which the drill pipe is replaced by tubing. The well is then swabbed in through the tubing, a pulling unit being used for this part of the operation.

The gas-oil ratio throughout the field varies, averaging from 350 to 450 cu. ft. per barrel while the minimum flowing bottom-hole pressure is approximately 300 pounds per square inch at —1,900 feet. Normal tubing pressure when flowing is 125



(Top) *Typical tank battery in the Zenith field. This lease produces no salt water, but the treating tank is already installed.* (Upper center) *Putting gasoline in the engine on one of the small jacks used to pump water in the Zenith, Kansas, field.* (Lower center) *Measuring a joint of pipe before placing it in the hole on one of the mechanical rotary rigs.* (Bottom) *Boilers fired with oil on a steam rotary. The treater for feed water is at left of boiler*

pounds per square inch; tubing pressure when closed is 600 pounds per square inch with 100 pounds per square inch on the casing. Practically all of the gas is in solution and operators are careful to conserve it while producing the oil.

The water problem is not so simple although there is not enough of it at the present time to cause much concern. Most of the wells drilled down-structure on the south end of the field encountered some water in the bottom of the hole. Others in the central part of the field obtained traces of water but there is no evidence as to its source. Only slight traces of water are found in the wells high on the structure and it is believed to be connate.

Potentials

Manner of taking potentials in the Zenith pool was changed late in the summer of 1938 from the open-flow method to restricted flow test in conjunction with flowing and static bottom-hole pressure tests for gauging the reservoir energy used. The change was made at the request of the operators to prevent unnecessary disturbance and dissipation of the reservoir energy. The tests were completed late in December of 1938.

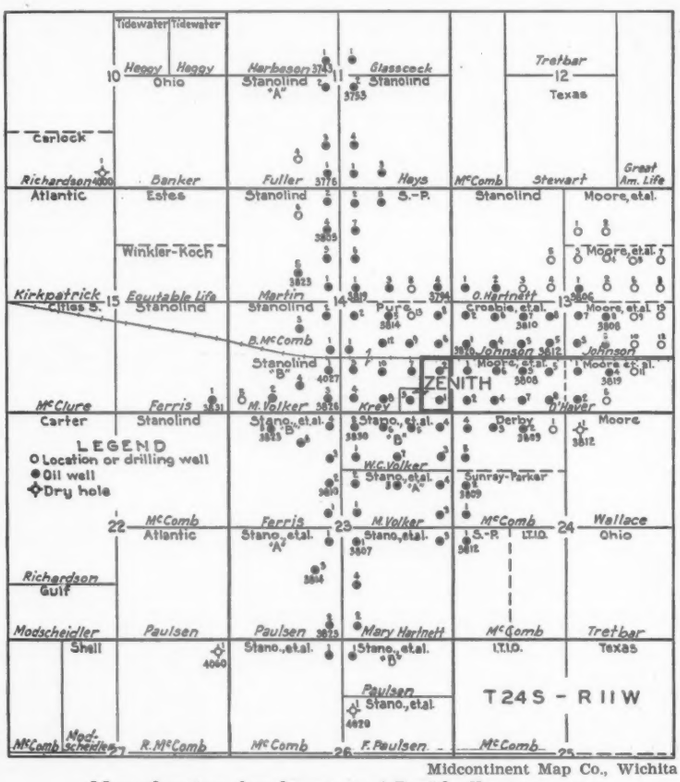
Each well was closed for 24 hours preceding its potential test and a static bottom-hole pressure test taken at —1,900 feet. When it is impossible to get the bottom-hole pressure bomb to —1,900 feet, due to location of the working barrel, etc., tests are taken at —1,550 and —1,750 feet and the static pressure at —1,900 feet calculated. An eight-hour production period is used as a basis for obtaining the flowing bottom-hole pressure; during the first three hours the operator may adjust the well, but after that the choke and valves must not be changed. Production is gauged at the end of each four-hour period, the amount of oil produced during the second period being multiplied by 6 to obtain the 24-hour restricted production. Hourly tests are made of the bottom-hole pressure while flowing.

The per cent of the reservoir energy used in making the test is calculated from the potential rating curve supplied by the state by applying the results of subtracting the average flowing bottom-hole pressure from the static bottom-hole pressure less 300. To obtain the unrestricted potential of a well the restricted rate of production is divided by the per cent of potential production obtained from the Corporation Commission's potential rating curve. Potential for the Zenith pool on January 1, 1939, was 208,236 bbls. daily.

Best producer in the field was the E. H. Moore No. 4 O'Haver, SE SW SW Section 13-24s-11w, which obtained a potential of 41,616 bbls. with a static bottom-hole pressure of 1,212 pounds per square inch, flowing bottom-hole pressure of 1,184 pounds per square inch, and a draw down of 28 feet. The well used only 3.07 per cent of its available pressure while making the test and produced only 4.2 per cent of its potential. Only nine of the wells tested obtained potentials less than 1,000 bbls. daily, the lowest potential in the field being 394 while the average potential for the field was 2,989 bbls. per day per well. Highest gas-oil ratio was 713 cu. ft. per barrel while the lowest was 305 cu. ft. per barrel. Many of the wells tested did not gauge the gas. Figure 2 shows a section of the work sheet for compiling potentials and gives an indication of the data involved and results obtained.

BIT PERFORMANCE IN THE ZENITH (KANS.) FIELD

From-to:	Footage	Time (hrs.)	Rate (ft./hr.)	Pump pressure (lbs./sq.in.)	Rotary speed (r.p.m.)	Weight (points)
261-1,540	1,270	35.3	36.2	500	90	4
1,540-1,830	290	25.2	11.5	500	80	8
1,830-2,135	305	31.8	9.6	550	80	10
2,135-2,489	354	30.6	11.5	550	75	12
2,489-2,820	331	31.8	10.4	600	75	15
2,820-2,993	173	25	6.9	600	75	15
2,993-3,126	133	19.5	6.8	600	70	15
3,126-3,350	214	31.7	6.7	600	60	15
3,350-3,491	140	25.6	5.5	600	60	15
3,491-3,589	98	17.6	5.5	600	60	15
3,589-3,788	199	37.0	5.4	600	50	15



Map showing development of Zenith, Kansas, area

Production Equipment

Most of the wells are equipped with 7-inch casing and 3-inch upset tubing, the main reason for the latter being the old method of taking potentials which allowed this as the maximum size tubing. Many of the operators had this size tubing on hand when the manner of taking potentials was changed and they are equipping new completions from this stock; smaller tubing, 2½-inch upset, is being used in the new wells by operators who have exhausted their 3-inch stock.

Many of the wells equipped with 3-inch tubing have an insert type working barrel, the main purpose being the better control of the wells, although there is some cutting of the standard working barrels due to the sand conditions. Seven-eighths inch sucker rods are commonly used.

Most of the wells flow naturally through the tubing, but on those that required pumping before the change in the potential test method were equipped with large jacks driven by internal combustion engines. Several flowing wells have jacks set over them as they must be "primed" before they will flow. Two wells failed to flow when scheduled for potential tests, but after they were pumped a short time began flowing again and have not required pumping since. Operators are also installing pumping units in anticipation of the day when the reservoir pressure will not be enough to flow the wells. This accounts for the large number of pumping units installed over wells that are now flowing and which will probably continue to flow for some time.

There are two geared powers recently installed, neither of which is operating, due to the wells flowing. All of the pull-lines and jacks are installed, the only thing needed to put the wells on the pump being the running of the rods. The geared power is driven by a horizontal, twin-cylinder single flywheel engine through V-belts to the power shaft. Seven wells will be pumped by the one power, while the other will handle eight wells.

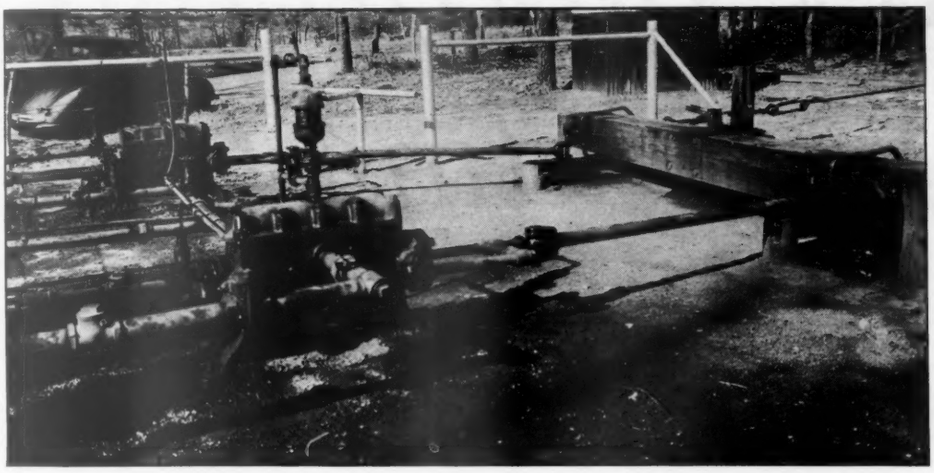
While the salt water problem is not bothering operators, two leases are equipped with automatic heaters and emulsion treaters which are not operating at present. The treating of oil for the removal of salt water will probably never reach the volume of some of the Kansas lime pools and the disposal of the water will not be

(Continued on Page 68)

SECTION FROM THE WORK SHEET USED TO COMPILE THE POTENTIALS AND ALLOWABLES FOR WELLS IN THE ZENITH (KANS.) POOL

			1	2	3	4	5	6	7	8	9	10	11
Lease—	Well No.	Company	Date tested	B.h.p. —1,900	Last 4 hours b.h.p. av. flowing	Draw down	Per cent available pressure Item 4 / Item 2-300	Per cent of potential	Bbls. per hour last 4 hours	Prod. last 4 hours	6 × last 4 hours' prod.	Potential Item 9 / Item 6	Gas-oil ratio last 4 hours
J. Krey	3	Pure	8-30-38	1,227.6	731.6	496	53.5	58.6	83.87	335.46	2,013	3,435	305
J. Krey	5	Pure	9- 3-38	1,228	699.25	529	57	62	59.29	237.15	1,423	2,295	313
J. Krey	2	Pure	9- 7-38	1,218	754	464	50.5	56	93.56	374.21	2,245	4,009	339
J. Krey	6	Pure	9- 6-38	1,228	527	701	75.5	78.5	60.01	240.06	1,440	1,834	334
Krey	12	Pure	11-22-38	1,313	995.5	317.5	31.3	36.9	61	247	1,484	4,022	390
Johnson	7	E. H. Moore, I.	11-19-38	1,204	707	497	55	60	41.5	166.2	997	1,662	449
I. Johnson	4	E. Crosbie	11-22-38	1,206	747.75	458.25	50.58	55.9	36.4	145.82	875	1,565	713
I. Johnson	8	E. H. Moore	11-25-38	1,248	749.6	498	52.5	57	37.3	149.55	897	1,574	349
O'Haver	2	E. H. Moore	9- 9-38	1,235	1,136	99	10.61	14	83.41	333.62	2,002	14,298	...
G. C. McComb	5	Derby	9-16-38	1,230	989	241	25.9	31	69.32	277.28	1,664	5,370	...
G. C. McComb	1	Sunray	9-20-38	1,220	673.75	546.25	59.4	64	32.9	131.58	789.48	1,234	...
O'Haver	4	E. H. Moore	9-21-38	1,212	1,184	28	3.07	4.2	72.83	291.31	1,747.86	41,616	...

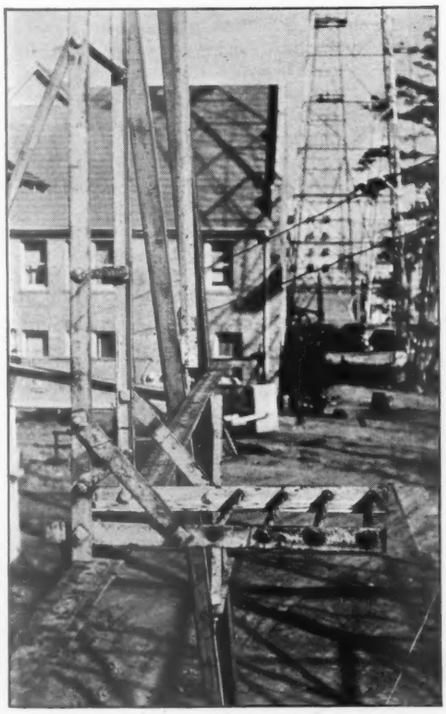
OPERATING IDEAS



Swing for Two Pipe Line Pumps on Oil Lease

In the Bryson pool of North Central Texas, one major oil company has converted two old jerker-type pumps for use in pumping oil from a small lease to its main line. Rod lines from a nearby bandwheel power are used to drive the pumps. Rod lines from the power are attached to both ends of a swing, while on the opposite sides of the swing clevis-and-pin-type connections are placed so that the pumps can be disconnected whenever desirable. At the pump ends of the shafts, swivels are provided to care for any sideward motion as the swing makes its cycle. The 3¾- by 24-inch double-acting pumps, as shown here, are disconnected.

Platform for Derrick Ladder

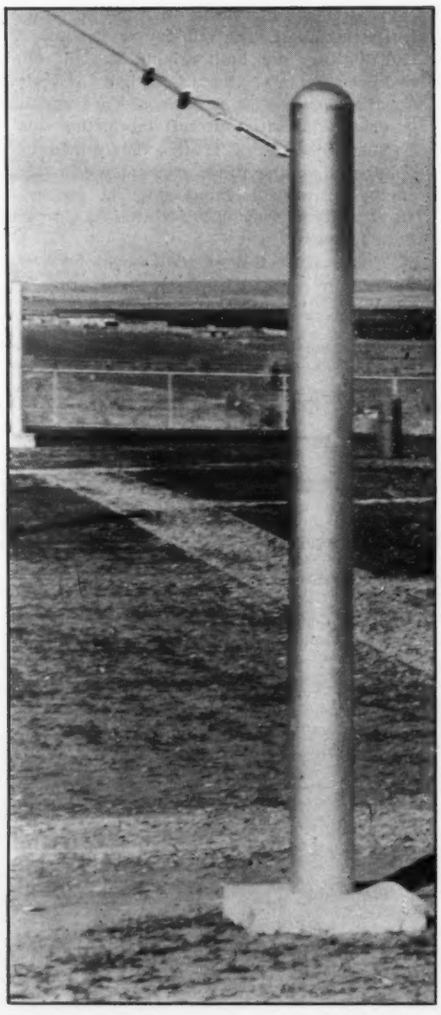


The common practice of ending the derrick ladder at the lowest cross piece serves the purpose of stopping much unauthorized climbing, but it presents a hazard for the man whose duties call for frequent use of the ladder. Without some positive warning of the approach of the bottom rung, it is sometimes fatally easy to reach for "just another step." Correcting this feature of derrick ladders, and providing a small working space from which to begin the ladder climb when carrying a burden, several East Texas producers have added an all-steel bracketed platform attached to the ladder foot. The platform affords a secure step and will sustain any load which a man can carry up the ladder.

Fill-Up Line for Diesel Motor

In checking the fuel consumption of mechanical rigs, the fuel tank is usually gauged at the completion of every tour. One operator decided to check by gauging the regular tank located on the back of the engine. Now the derrick-man no longer has to climb to the platform to gauge his fuel at the beginning and end of his tour. Another advantage is the maintenance of a correct amount of pressure on the fuel supply line. The 2-inch supply line has been reduced to a 1-inch line; a valve and a half swing has been installed. To fill the tank, it is only necessary to unscrew the bull-plug in the end of the 1-inch line and replace it with a short nipple; the half swing permits placing the end of the line in the mouth of the tank. The bull-plug prevents fuel from running over the engine in case the 1-inch valve should leak.

Anchor for Guy Line



To keep guy lines off the ground for the purpose of eliminating the possibility of their being tripped over by men about the plant or run over by trucks, several gas pipe lines have found it advisable to anchor to the top of a post which is higher than a man. The post is a bull headed nipple set in concrete.

Chemistry of Aircraft Lubricating Oils

By C. M. LARSON
Chief Consulting Engineer,
Sinclair Refining Co., New York*

In recent years aircraft lubricating oils have become essentially chemical in nature. Lubricants merely separated from petroleum are not satisfactory in our present-day high-output aircraft engines. The chemistry of hydrocarbon arrangement or elimination of certain ones through refining, correction through chemical addition agents are studied so as to learn more about the properties such as viscosity index, oxidation, corrosion resistance and oiliness. The requirements for aircraft engines of different makes and service make it necessary to study the chemical reactions of oils rather than the physical characteristics alone. The military service and Pratt and Whitney are built around straight mineral hydrocarbon oils whereas Wright Aeronautical Corp.'s approved list is composed of compounded or chemical additive-aircraft lubricating oils.

Since viscosity is a state determined by the temperatures, the range encountered in aircraft engine operation is important. The proper inlet oil viscosity corresponding to oil, in temperatures, is as follows:

	S.U.V. of inlet oils—seconds
For take-off, normal	2800 or below
For take-off, emergency	6000
Desired operating state	500-110

*Presented before National Petroleum Association, Oil City, Pa.

In order to cover the widest range of temperatures, high viscosity index has been used in specifications. Most transport airlines use the range 115 to 125 seconds Saybolt at 210° F. and the V.I. is at least 95 min. The Navy have made changes in certain engines and it has established 90-105 seconds S.U.V. at 210° F. with a 95 V.I. minimum as its standard grade. The Army has a tendency to use 100 V.I. minimums and use in addition to the 120-100 namely 80 and 65 seconds at 210° F. ±4 seconds. This is because of lower emergency take-off temperatures of the Army.

Chemistry of Viscosity Index (V.I.)

The problem of V.I. requirements has made the selection of hydrogen and carbon relationship of utmost importance. Naturally high paraffinicity is desirable. Additional compounds are put into lubricating oils to improve the property of viscosity index. Besides Paratone, Acrylic ester has indicated a way. When Acrylic ester was blended with a Mid-Continent oil of 65 seconds at 210° F. the viscosity was raised to 122 seconds at 210° F. and the viscosity index to 127. This was accomplished with no change in the original carbon residue or neutralization number from that of the original 65 seconds at 210° F. oil. What the additional agents for improving V.I. mean as evaluated for aircraft engine service performance is little known at this date and caution seems to be the order of the day. It is reasoned that if single molecule lubrication oils were possible then viscosity index would cease to be a problem for such homogeneous single molecular substances would not have temperature viscosity changes as is the case with the complex hydrocarbon range of the present aircraft lubricating oils.

Refining

Realizing that high viscosity index and stability against sludging are essential, many refining attempts were made in this respect. In most cases various solvent refining methods were used. It soon became apparent that the crude and refining methods were very important if other than viscosity index were to be considered. Naturally the reduction of carbonaceous sludge in the crankcase and that baked on the waffle on the underside of the piston is important but not at the expense of wear, stuck rings, varnish on pistons and corroded bearing surfaces. To date the chemistry of aircraft lubricating oils is a cut and try method.

The chemical changes that take place are those related to stuck rings, corrosion, wear and organic deposits. Usually refiners use the A.S.T.M. carbon residue as the yardstick of refinement and this ranges from an allowable of 1.6 down to 0.35 for the 120 seconds S.U.V. oil at 210° F. Yet, carbon residue is no indication of the true rate of oxidation of hydrocarbon lubricating oils and their resultant effect in aircraft engine operation.

There are several oxidation tests but with the exception of the Navy work factor (U. S. Navy, Bureau of Engineering Bulletin N.ENG. 31—1937) and the U. S. Army oxidation test (No. 29 LA, March 1, 1938, Paragraph F-5) no others are required by air transport operators or aircraft engine manufacturers. From experience gained from aircraft engine flight operation, it appears that the degree of oxidation changes greatly with degree of refining. With normal clay treatment, the sooty, carbonaceous material forms in the crankcase and on certain parts but with low asphaltene content (chloroform soluble) no real binder is present to lacquer piston or stick rings appreciably. As the carbon residue is lowered to a figure much below the viscosity at 210° F. divided by 100, the oxidation products are soluble in hot oil and deposits occur only on the hot surfaces of the piston, in the ring grooves and on the inlet valve stems

Sixty-six big Navy amphibian bombers on runway at San Diego, before take-off for Canal Zone and Cuba

SIMPLICITY

the outstanding feature

of the PENBERTHY REFLEX GAGE

(Licensed under Jerguson Patent)

● "It is the most simple gage to service that I have ever seen." This statement is typical of the remarks made throughout the oil fields since the Penberthy Reflex Gage was introduced.

Note particularly the U-Bolt type of construction that is the strongest and the simplest to service. To replace a glass, simply remove the nuts on the face of the gage . . . it is unnecessary to work between the gage and the boiler.

The Penberthy Reflex Gage shown here is available in both Navy Bronze and Malleable Iron; it is recommended for working pressures to 350 lbs. at 450° F. Gage is furnished complete with Penberthy "Dripless" Drain Cock shown.

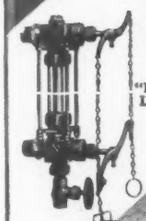
Other Penberthy Reflex Gages are made in any length desired for higher pressures and for various kinds of liquids. Any leading oil well supply distributor will be pleased to quote upon your particular requirements.

PENBERTHY PRODUCTS

PENBERTHY INJECTOR COMPANY *Manufacturers of* QUALITY PRODUCTS *Since 1886*
DETROIT, MICH. • Canadian Plant, Windsor, Ont.

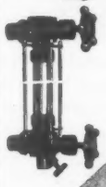
Automatic Injector

Ejector, Syphon or Jet Pump


"Navy Type" Liquid Level Gage

"Safeguard" Automatic Liquid Level Gage

"All-Iron" Automatic Liquid Level Gage

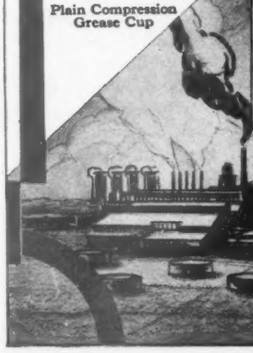


Gas Engine Lubricator

Snap Lever Oiler

Plain Brass Oil Cup

Plain Compression Grease Cup



Screw Plunger Grease Cup

Spring Compression Grease Cup

Automatic Electric Sump Pump

Automatic Cellar Drainer (Water or Steam Operated)

Dipless Air Cock

where there are low rates of oil flow. Such oils also pick up iron salts, which salts in solution accelerate oxidation much the same as iron naphthenate used in the paint industry. Too, the oxidized products, carbonaceous matter (insoluble A.S.T.M. naphtha), asphaltenes (chloroform soluble) and iron salts, the blowby soot lead from the fuel contaminates the aircraft lubricating oil in the system. The lead from the tetraethyl lead in the aircraft fuel comes down in a gaseous state and solidifies in a very fine state as lead sulfate, lead bromide, and lead chloride. The sulfur comes from the fuel; the bromide and chloride from the tetraethyl lead. These lead salts are thrown out in various parts of the engine by its high centrifugal force. Highly refined oils that form lacquers or varnish stick these lead salts to more harmful parts of the engine. Phosphites are being tried in laboratory set-ups as antioxidant addition agents but their use in aircraft engine lubricating oils is little known in the presence of lead at high temperatures met with in the aircraft engine.

The used oil sludge analysis is a very poor index for ring sticking, lacquer, etc., as there is no direct correlation with aircraft engine service performance. The viscosity increase due to oxidation does affect the relationship covered under oil inlet requirements of aircraft engine operation.

The full scale, 50-hour endurance test, using the following score, is recommended by an aircraft engine manufacturer:

SCORE ENGINE INSPECTION

	Points allowable
Pistons, wear and appearance	5
Piston pin bosses wear	1
Piston thrust surface appearance	4
Piston rings:	
Wear	20
Stuck	5
Feathered and sharp	5
Cylinder wear and appearance	10
Total, pistons, rings and barrels	50
Piston pin wear	1
Link pin wear and appearance	4
Link pin bushings	1
Piston pin bushings	1
Master rod journal wear	8
Master rod bearing	14
Red. gear bushings	3
Crankcase general cleanliness	6
Crankcase sludge	5
Crankshaft journal cavity	2
Filter	5
Total for remainder	50
Total for engine	100

Laboratory Analyses

Sludge value	Viscosity deduction
Asphaltene value	Neutralization deduction

Used oil score times 1, plus engine inspection score times 2, divided by 3, equals net score.

Corrosion

Corrosion resistance of bearing materials is the most recent of the properties to be given consideration. The problem obviously occurs only when there is a material subject to attack and a corrosive lubricant.

The Chemistry of Corrosion

The usual method of checking aircraft oils for acidity is by the A.S.T.M. neutralization number for both new and used oils. In the first place various laboratories cannot check each other using the sample. The differences have been as high as 300 per cent on aircraft lubricating oil samples. Then, too, whether the A.S.T.M. method for straight mineral oils or compounded oils should be used is not known especially for used oil samples as the high neutralization may be caused either by oxidation or by addition agents of the oiliness type. The National Bureau of Standards has tried to improve the technique but there is still a long way to go to get better reproducibility.

The neutralization number of used aircraft lubricating oils in no way indicates the corrosive action of the used oil in service. In some cases a neutralization number of 1.0 may not attack the bearing metals yet in other service tests 0.2 number will show high corrosive tendencies in short periods of aircraft engine operations.

The addition of oiliness addition agents in some instances will show bearing corrosion especially where cadmium and certain lead base

(Continued on Page 67)

SAFETY - Foot Guard on Rotary Table

Reduction of the number of physical hazards on rotary rigs has resulted in a decline in the number of accidents due to this cause. While there is still work to be done along this line, the drilling department and manufacturers of drilling equipment have cooperated in eliminating many potential sources of accidents.

The old rotary table was a crude piece of machinery compared to the modern stream-lined, roller or ball bearing, oil bath table. The open pinion and drive gears, which were greased by daubing jack-post grease with a stick, are now enclosed. The old grip-rings, which drove the top hydraulic joint of pipe and which had to be slipped occasionally to allow drilling to proceed, have been replaced by drive bushings, some of which are roller bearing.

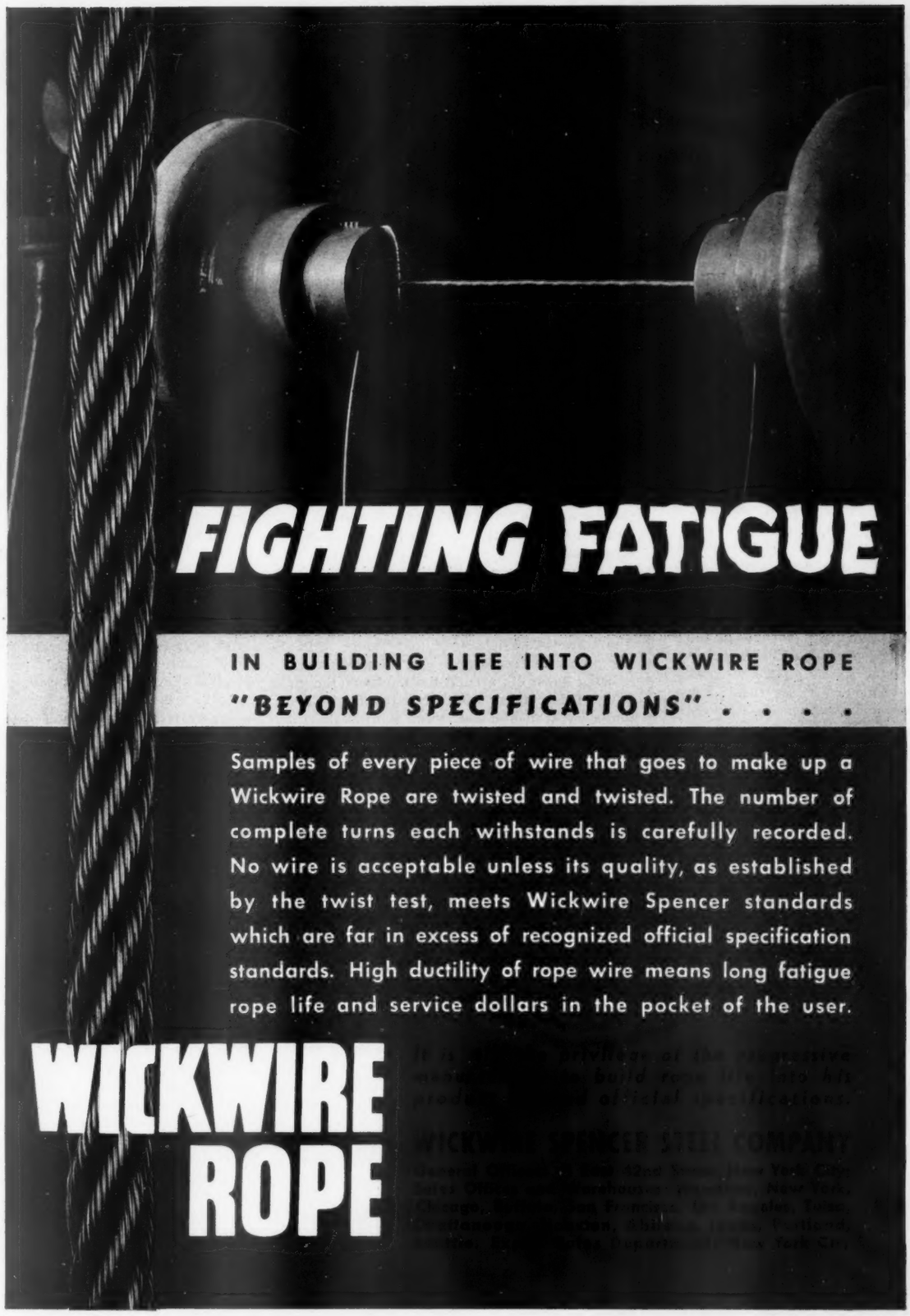
With the improvement of bearings and races, the table turns easily and coasts after the clutch has been disengaged. The traveling block falls faster and now it is not uncommon for the elevators to be in position to latch on the drill pipe while the rotary table is still turning after spinning out a stand. As speed of operation is desirable, it has become necessary to either provide a means of stopping the rotary table or partially cover it so the floor men can be in position to latch the elevators as soon as they reach the floor. Some drillers try to control the power applied to the rotary so it will turn just enough to unscrew the stand, but this is very difficult due to the large number of factors involved. Stepping on a moving rotary table can result in a bad fall and a serious injury. The rotary table in the above picture has a stream-lined guard which covers the outer 6 inches of the table.

The ropes on the pipe rack are an essential part of the pipe-rackers' equipment and, despite appearances, they are not placed just helter-skelter. The general procedure is for the pipe-racker to make one trip before roping the pipe-rack as he will thus locate exactly where he wants the foot braces. Each pipe-racker on the crew may have a particular habit that requires a rope in a certain place. They are very helpful both coming out and going in the hole, the pipe-racker placing his feet against them and then using his body as a lever to put the pipe in its proper position.

The rope in the left foreground is a brace for the left foot of the back-up man; for successful and speedy operation of the tongs it is essential that the left foot be braced so force can be applied with the right arm or shoulder to get the tongs into the position where they will grip the pipe. Slipping of the left foot would cause the back-up man to fall, either landing partially on the rotary table or cracking his chin on the tong handle.

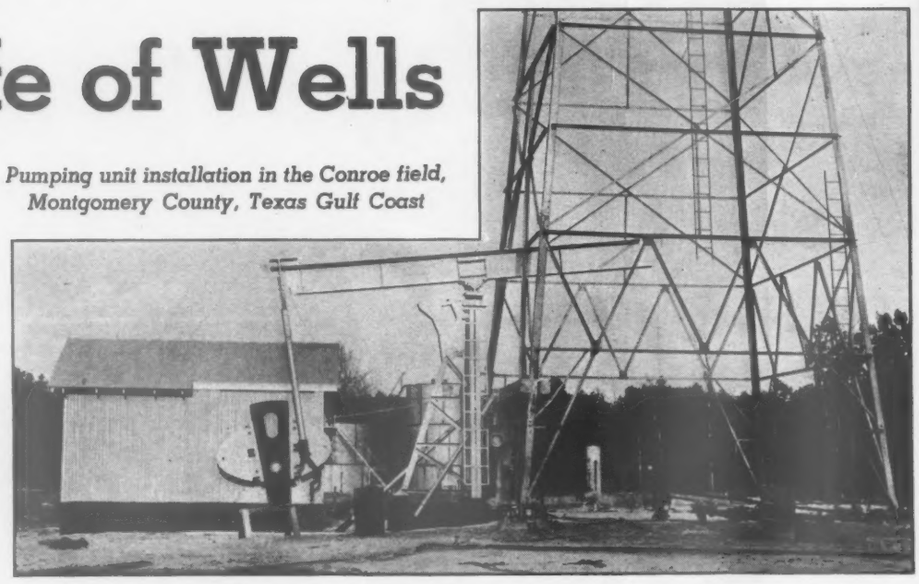
The rotary chain-guard fits closely around the chain and sprocket and there is no danger of slipping and becoming entangled in the chain. The drum is guarded by a steel guard, also; both of these guards on this rig were designed by the manufacturer. The heavy drum guard is often used as a hand-hold for the left hand when racking heavy pipe.

The position of the slips is such that they are completely out of the way and they also indicate the safety consciousness that has been developed over a long period in rotary workers. Slips are never left with their faces up because in that position they are much easier to trip over; they are always placed face down when not in use.


FIGHTING FATIGUE
IN BUILDING LIFE INTO WICKWIRE ROPE
"BEYOND SPECIFICATIONS" . . . .
Samples of every piece of wire that goes to make up a Wickwire Rope are twisted and twisted. The number of complete turns each withstands is carefully recorded. No wire is acceptable unless its quality, as established by the twist test, meets Wickwire Spencer standards which are far in excess of recognized official specification standards. High ductility of rope wire means long fatigue rope life and service dollars in the pocket of the user.
WICKWIRE ROPE

Production Practices at Conroe Extend Life of Wells

By A. S. PARKS
Engineer, Conroe Operators Association

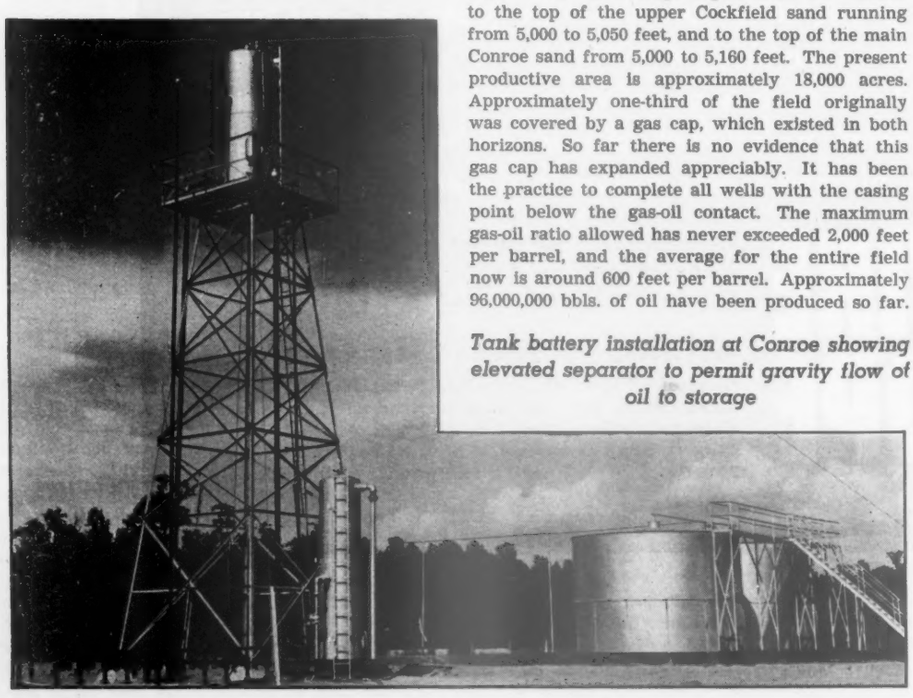


Pumping unit installation in the Conroe field, Montgomery County, Texas Gulf Coast

Now, seven years old the past month, the Conroe field, Montgomery County, Texas Gulf Coast, is beginning to reap the benefits of orderly development and production practices followed by operators in the field. Through well preserved reservoir energy, the flowing life of the field is being maintained. During the past year, due to greatly restricted rates of withdrawal, bottom-hole pressure has been steadily increasing. This is creating an unusually healthy condition of balance between water drive advance and withdrawal rate.

The Conroe field was discovered December 13, 1931, which is the date of completion of George Strake No. 1 South Texas Development Co.; this was originally a gas-distillate producer from the upper Conroe sand which was later deepened to the main Conroe sand as an oil well. So far as known productive areas and sands are concerned, the field is entirely drilled up; altogether 1,029 wells have been drilled. Of these, 946 are carried on the allowable production schedule as oil producers, and 13 as gas wells. The remaining 70 wells either were dry originally or have been subsequently abandoned. In the field's development, a 20-acre spacing pattern was followed. So closely was this spacing adhered to that the average density of the field fully developed is one well to 19 acres. Exceptions to the spacing rule occurred only where forced by small tract ownership. From the beginning, despite the field's size and varied ownership, operators cooperated in a definite program to develop the field and complete and produce the wells according to the most systematic, scientific and efficient principles of operation.

There are two productive sands, the main Conroe sand and the upper Cockfield sand, both of which are of Cockfield age, and their deposition conforms to the elliptical dome shape of the field. The upper Cockfield sand, averaging about 15 feet thick, carries largely gas, oil production in it being down dip around the flanks of the main field. Three major faults cut the field. These faults have an east-west trend with various displacements ranging up to nearly 300 feet. In the early life of the field, the two producing formations were thought to be connected by faults, but later developments have shown this is not the case. There is an interval of approximately 150 feet of shale and sand between the two producing sands with the average depth from the surface to the top of the upper Cockfield sand running from 5,000 to 5,050 feet, and to the top of the main Conroe sand from 5,000 to 5,160 feet. The present productive area is approximately 18,000 acres. Approximately one-third of the field originally was covered by a gas cap, which existed in both horizons. So far there is no evidence that this gas cap has expanded appreciably. It has been the practice to complete all wells with the casing point below the gas-oil contact. The maximum gas-oil ratio allowed has never exceeded 2,000 feet per barrel, and the average for the entire field now is around 600 feet per barrel. Approximately 96,000,000 bbls. of oil have been produced so far.



Tank battery installation at Conroe showing elevated separator to permit gravity flow of oil to storage

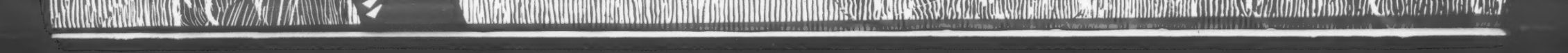
Original recoverable oil in place has been estimated as high as 640,000,000 bbls. Estimates vary as to the probable flowing life of the field remaining but, assuming that present conditions will continue, it is not questioned that a number of the wells still will be flowing 20 years from now. Original reservoir pressure was estimated at 2,275 pounds. Pressure decline to date has been only slightly over 2 pounds per million barrels of oil withdrawn, present pressure being around 2,080 to 2,083 pounds.

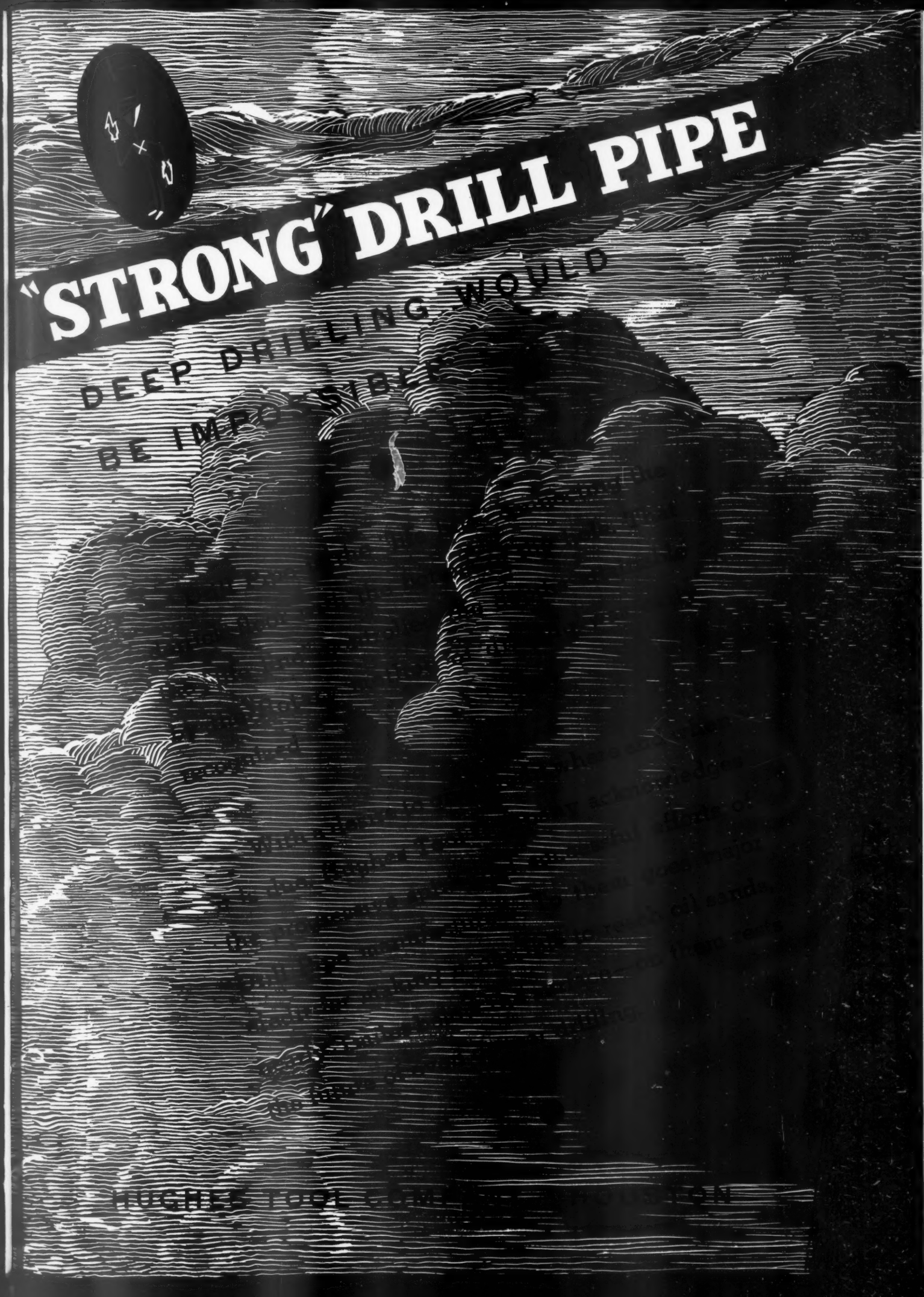
There is an active water drive at Conroe, as is characteristic of Gulf Coast fields. The number of wells showing water has been steadily increasing, but the problem of salt water disposal is not yet acute. Peculiarly, water intrusion is not confined to wells located down structure, nor to extreme edge wells. Apparently, water has entered central parts of the field through fault planes, but this has not been proved. A great deal of work and study is being carried on by operators in attempts to determine definitely the reason for the erratic water behavior.

Approximately 50 wells have been worked over to control water production. The customary procedure is to pull screen, squeeze cement into the formation, and leave varying amounts of sand plugged off at the bottom. When recompleted, about 80 per cent of the wells thus worked over make pipe line oil, and in most of the remainder the water percentage is substantially reduced. At present water is only about 15 per cent of the total fluid produced, although there are several extreme edge wells that are producing nearly 100 per cent water. In producing present restricted allowables, some difficulty is experienced with wells making water, in order to keep them flowing over a 24-hour period. This is due to the water heading up in the tubing since the velocity of flow in the tubing is not sufficient to lift it with the oil. Some operators get around this trouble by flowing the wells at a higher rate for a shorter period and shutting the well in for the remainder of the day.

Considerable experimental work has been done with small tubing strings in flowing wells which make water. When 1-inch or 1¼-inch tubing is used for the flow string instead of the customary 2½-inch tubing, a substantial increase in velocity

(Continued on Page 54)

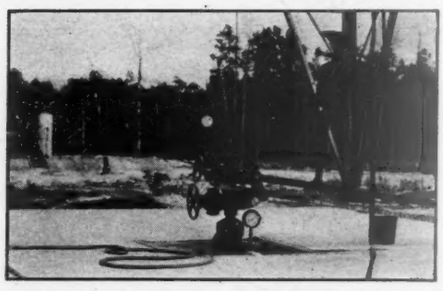



"STRONG" DRILL PIPE
DEEP DRILLING WOULD
BE IMPO

of flow up the tubing is obtained with the well producing at the same rate. Thus water is lifted with the oil, and wells thus equipped can be flowed 24 hours at the allowable rate. Some of these small tubing strings are equipped with kick-off valves to start flow, but after the flow is started they are rarely needed. There are about 15 wells at Conroe equipped in this way.

Another method that promises to be successful in flowing water wells over a 24-hour period makes use of an automatic purging device. This is simply a pressure-operated valve installed so that when the tubing-head pressure drops to a point where there is danger of the well going dead, an auxiliary choke is opened, thus increasing the rate of flow. As a result the load of water is brought up, and as the tubing is purged of water, the tubing-head pressure goes up. This increase in pressure causes the extra choke to close and the well continues to flow normally until another head of water accumulates. This method has been used experimentally on only two wells, but one of these has been flowing for almost a year.

Out of the 946 producing oil wells in the field, about 80 require some form of artificial lift. Only a dozen of these are on the beam; the trend is definitely away from the use of rods. Various types of gas-lift devices have been tried with different degrees of success, but intermitters are proving to be the most successful. It is probable that many Conroe wells will be produced to abandonment with gas lift. The field has a sizeable gas reserve, and with present gas-lift intermitters, ratios, as low as 1,200 cu. ft. per barrel, are obtained with installations lifting water from



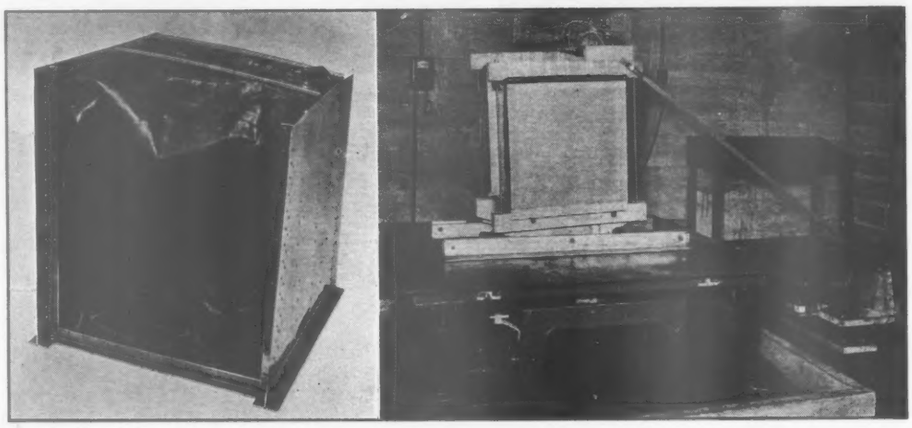
Gas-lift installation in Conroe field. Approximately 80 gas-lift installations of varying types are in operation in the field

5,000 feet. The great objection to gas-lift methods has always been inability to produce a low fluid level well to exhaustion, but the use of closed gas-lift systems, coupled with intermitters, is rapidly overcoming this obstacle.

In gas production, rigid conservation is being observed. There are two gasoline recovery plants in the field; one is operated by Midland Gasoline Corp. and the other by Humble Oil & Refining Co. These plants together are processing approximately 20,000,000 cu. ft. of gas daily, representing as much as 90 per cent of the gas production of the field. A large part of the residue gas is being taken by United Gas Pipe Line Co. for transportation through its system to market consumers. Comparatively little gas is blown to the air.

Orderly and efficient production of the field has been facilitated by work of the Conroe Operators Association. This organization, composed of representatives of all operators in the field, has directed its efforts to a study of operating conditions, and to the development of practices that permit the conservation and preservation of reservoir energy. Problems, both individual and for the field as a whole receive the attention of the association; by cooperation of operators in the solution of the problems, the field as a whole is being benefited.

Flexible Airplane Fuel Tank Lengthens Period of Utility



(Left) Fuel cell showing loose fitting lining. (Right) High-frequency low-amplitude vibration table for testing airplane gasoline tanks

The photograph shows the recently patented "Mareng fuel cell," made of thin, fabric impregnated with synthetic rubber, as installed in shell representing a compartment of an airpline's wing-structure fuselage or float. Note the "oversizing" which relieves the fabric of all flying strains and stresses.

No design for an airplane gasoline tank is approved for use until its vibration endurance has been demonstrated by an accelerated disintegration test, on a high-frequency vibrating table—a standardized test which, when devised, was calculated to destroy any tank's usefulness within 50 hours. So far more severe is this ordeal than conditions met in actual flying, that a tank which can withstand even 15 hours of the abuse is adjudged acceptable for some uses. Subjected to this test the Mareng fuel cell was still triumphantly fuel-tight at the end of 700 hours—that is to say, 650 hours beyond what the devisors of the test had calculated to be a tank's maximum possible performance. In contrast, the supporting structure several times required repairs.

Other advantages pointed out by its makers, the Glenn L. Martin Co., Baltimore, Md., manufacturers of flying boats and military aircraft, are (1) elimination of necessity for making surrounding structure gas-tight; (2) double safeguard against corrosion by keeping gasoline, or water present in gasoline, out of contact with metal and by complete inertness of synthetic rubber to gasoline; (3) retarded leakage in event of puncture, the slit fabric tending to be self-closing, permitting continued flight; (4) quick repairability of the fabric which, if punctured, can be easily removed, patched in 10 minutes and reinstalled, resulting in a cell which is as vibration-proof as when new, without requiring repair of holes in surrounding structure.

Under a contract just completed between the patent holder, the Glen L. Martin Co. of Baltimore, and E. I. du Pont de Nemours & Co. of Wilmington, Del., the latter company will extend the market for the recently announced "Mareng Fuel Cell" into several fields of industry.

The new cells are made of du Pont "Neoprene," a light fabric impregnated with synthetic rubber, and can be described as oversized "inner tubes"; they offer many opportunities in other fields for economies in the construction and maintenance of fuel containers, because the supporting structures need not be gas-tight.

Geologists Provided With Short Course on Aerial Photography

The University of Oklahoma will hold a short course in Norman, February 17 and 18, on the subject of Aerial Photographic Mapping and Geological Exploration. This will be under the direction of Associate Professor Frank Armon Melton, of the department of geology, and the extension division, from whom information regarding the course may be obtained.

Donald C. Barton, geologist and geophysicist, Houston, Tex., "The Art of Reading Aerial Photomosaics." Slides, 45 minutes.

Frank G. Evans, geologist, Shell Petroleum Corp., Houston, Tex., "Methods Used in Making Geologic Interpretations From Aerial Photographs." Slides, 45 minutes.

Marshall S. Wright, special adviser on aerial photography to the secretary of agriculture, Washington, D. C.; first vice president, American Society of Photogrammetry; correspondent and committee member of International Society of Photogrammetry, "New Developments in Aerial Mapping and Mapping Equipment"; 45 minutes. "An Informal Account of the October Meeting of the International Society of Photogrammetry in Rome."

T. P. Pendleton, U. S. Geological Survey; Aerial Surveys Unit, Tennessee Valley Authority, Chattanooga, Tenn., "On the Construction of Contour Maps by Stereoscopic Methods From Aerial Photographs"; 45 minutes.

Louis Desjardins, geologist, Aero Exploration Co., Tulsa, "Geologic Mapping From Aerial Photographs." Slides, 45 minutes. Illustrations from Oklahoma, Kansas, and Kentucky.

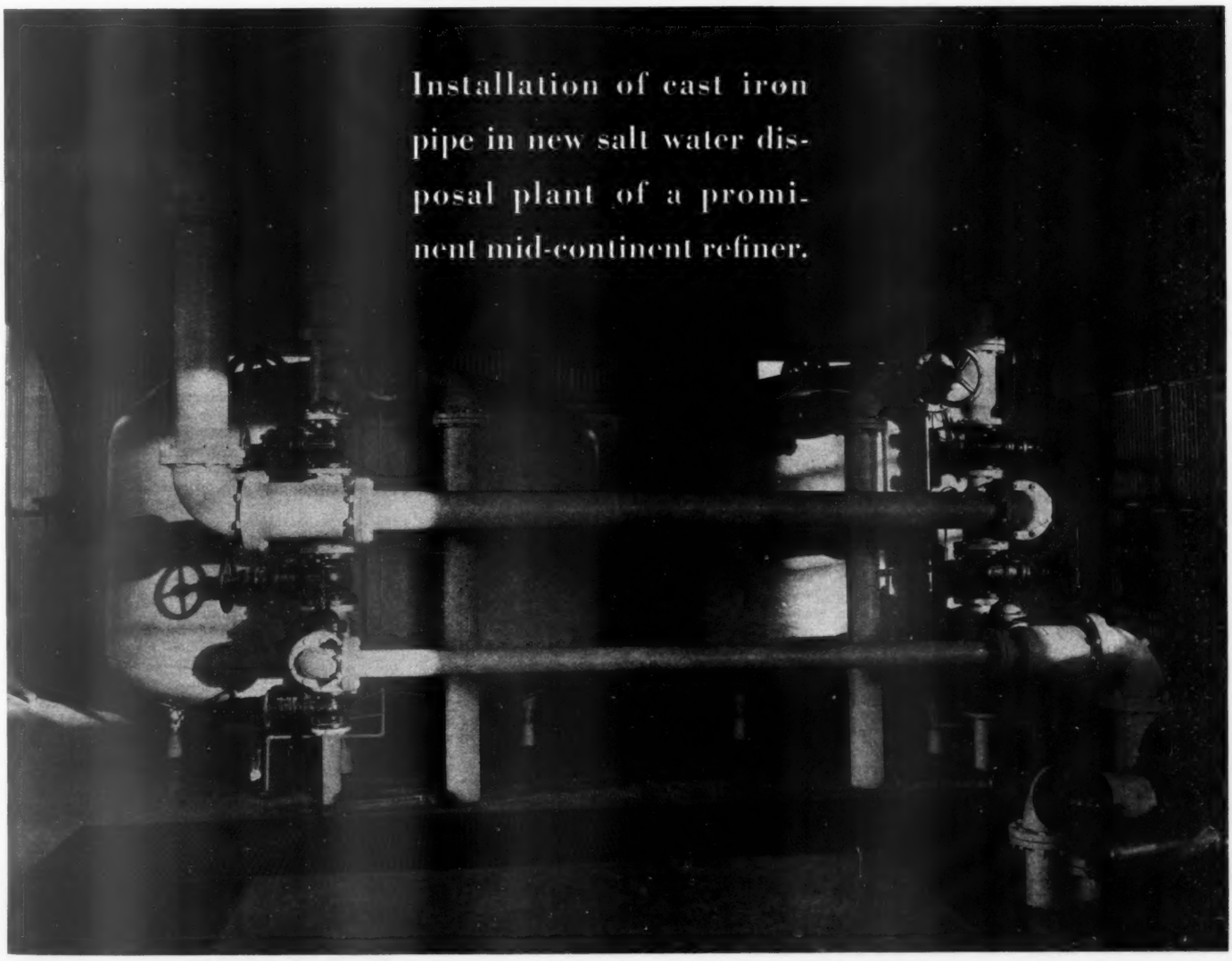
J. C. Carpenter, senior highway engineer, U. S. Bureau of Public Roads, Fort Worth, Tex., "The Relationship of Aerial Mapping to Highway Engineering"; 15 minutes.

Maj. Eric Haquinius, chief of surveys, Brazos River Conservation and Reclamation District, Mineral Wells, Tex., "Topographic Mapping With the Multiplex Projector in the Brazos River Conservation and Reclamation District"; 20 minutes. The projector will be demonstrated after the sessions.

Frank A. Melton, associate professor of geology, University of Oklahoma, "The Use of Aerial Photographs and Inductive Teaching in Geology." Slides, 30 minutes.

DEPENDABLE DURABILITY with low-cost cast iron pipe

Cast iron pipe is the lowest first-cost material with dependable durability under corrosive conditions and the most economical in the end for such refinery uses as cooling and condensing coils, run-down lines from manifold, compressor station discharge lines and for salt water disposal. Replacements with cast iron pipe have proved this in many refineries. Cast iron pressure pipe is available in bell-and-spigot, plain and threaded ends, and flanged types, or with bottle-tight mechanical joints, in diameters from 1¼ to 84 inches. For further information write to The Cast Iron Pipe Research Association, Thos. F. Wolfe, Research Engineer, 1015 Peoples Gas Bldg., Chicago, Illinois.



Installation of cast iron pipe in new salt water disposal plant of a prominent mid-continent refiner.

Progress in METALS

By W. L. NELSON

Tellurium Lead Has Superior Properties

Many of the commercially important properties of lead are improved by the addition of 0.05 per cent of the metal tellurium. The compositions of other common types of lead are indicated approximately in the following tabulation. Only the percentage of the major alloy element is given but the amounts of impurities may be obtained in the paper entitled "Corrosion Resistant Lead Equipment," Mechanical Engineering, page 793, December 1936, by George O. Hiers of the National Lead Co.

	Pct. lead	Pct. major alloy element
Chemical lead	99.924	0.06 copper
Purest commercial	99.9968	0.0012 antimony
Common	99.9090	0.089 bismuth
Corroding (for making white lead)	99.9528	0.045 bismuth
Antimony lead	.....	6-12 antimony
Tin lead	.....	3-6 tin
Tellurium lead	99.874	0.06 tellurium

Even small amounts of impurities or alloy elements cause relatively large changes in physical properties. The relatively high strength, hardness, and endurance limit of tellurium lead as compared with other leads is indicated in Table 1.

steam pressure of 45 pounds with an inside temperature of about 240° F., are said to be in use in a large eastern plating plant, where the installation has thus far proved superior to other leads previously used.

"Another severe requirement, tanks for mixing sulfuric acid in large storage battery plants where considerable heat is evolved, with consequent expansion and contracting of the tank lining, often results in buckling and cracking of the lead. Here tellurium lead is reported to withstand conditions with less replacement than previous leads. Indications in the past two years of actual use are that this lead will extend the life of equipment in the case of the more drastic, high-temperature corrosion requirements of industry. The salvage value of lead in discarded chemical equipment is high."

Corrosion Tendency of Oil Stocks

Although the general suitability of certain metallic materials for withstanding corrosive oils has been established, the degree of resistance exhibited by such materials when exposed to different oils is by no means consistent. In a partial effort to meet this situation, an increasing interest by plant chemists is being exhibited with regard to laboratory test methods for determining the amounts of corrosive agents contained in oils or liberated from them during processing.

TABLE 1—RELATIVE PHYSICAL PROPERTIES OF LEAD

	Tensile strength at rate of 0.25 in. per in. per min.	Endurance limit	Elongation per cent	Brinell hardness
Pure lead (99.9)	1750-1900	400	55	3.5–4
Chemical (0.06 Cu)	2200-2800	600	50–56	4.5
Tellurium (9.06 Te)	2800-3400	900	32–37	5.8
Ternary (0.25 Cd-1.5 Sn)	*3800	1100	62	5.7
Hard lead (1 Sb)		1300		
Hard lead (8 Sb)	4800-7400	.....	22–50	8–13.4

*Rate of 0.6 in. per in. per min. rather than 0.25.

The high strength of the hard leads reported in Table 1 is not entirely justified because such leads lose strength rapidly at even slightly elevated temperatures. Thus, chemical lead (0.06 Cu) and tellurium lead are both stronger than antimony lead, at a temperature of even 250° F.

In resisting sulfuric acid the tellurium lead appears to be very satisfactory particularly at elevated temperatures. Thus flash tests of the corrosive action of 90 per cent sulfuric acid for three minutes on leads at a temperature of 304° C. show:

	Loss, pct.
1. Tellurium-chem. (0.06 Te)	1.2
2. Very pure electrolytic	4.5– 5
3. Chemical lead (0.06 Cu)	5.1– 5.6
4. Pure commercial	19.1–19.8
5. 8 antimonial	100% plus

Quoting George O. Heirs in Mechanical Engineering: "Although tellurium lead has been recently taking its place as a new material in equipment, testimonials of notable service are already being received. Large tonnages are in use. A Midwest company is successfully using tellurium-lead coils as a heat exchanger handling hot sulfurous acid at 160-180° F. under a steam pressure of 20 pounds and is using tanks lined with tellurium lead in continuous operation for strong sulfuric-acid solutions which, during the operation, reach the boiling point of the acid solution, with agitation. Steam coils, heating 66-Be. sulfuric acid at a

The problem is more complicated than to simply analyse for sulfur or salt because the amount of these materials is not directly related to the amount of liberation of hydrogen sulfide or hydrochloric acid that will occur in the plant. The literature contains many references which show that a high sulfur content does not necessarily cause severe corrosion and that some salt brines cause more severe corrosion than others. Nevertheless, complete analytical procedures for analysing oils and brines are useful and necessary as fundamental conditions upon which to interpret the more empirical types of corrosion tests or plant conditions.

Chemical Analyses

Modifications of the procedure proposed by W. R. Matthews[1] for determining chlorides in crude oil is widely used.[2,3] A somewhat complete procedure of this kind is recommended by the Universal Oil Products Co.[3] but only the shorter procedure of Hawthorne and Bedell[2] is given here.

"Five hundred ml. of the crude oil to be tested are transferred to a 3-liter glass-stoppered bottle; 125 ml. of acetone are added, and the bottle is shaken vigorously for two minutes; 1,375 ml. of distilled water are next added, and the mixture is shaken for an additional three minutes. Finally, 2 grams of sodium soap are added, and shaking is continued for another three minutes.

"The bottle is permitted to stand until the aqueous phase becomes clear—preferably for two or three days. Samples of this phase are then removed with a siphon. To 500 ml. are added 25 ml. of a 20 per cent magnesium-nitrate solution. The mixture is made neutral with nitric acid, and an excess of 5 ml. of 50 per cent nitric acid are added. An excess of standard silver nitrate is measured in, followed by 5 ml. of ferric-alum indicator, and the excess of silver nitrate is determined by titration with standard potassium thiocyanate. The endpoint is indicated by the appearance of the red color of ferric thiocyanate.

"If 0.1 N solution of silver nitrate ($AgNO_3$) is used, the following relationship applies:

(ml.$AgNO_3$ ⊂ Cl–in. 500 ml. water) (2.05) = grains per gallon of chlorides in oil as NaCl)."

Other methods of chloride determination are proposed by Puckett of the Barnsdall company[4] and Davis and others of the Continental Oil Co.

Methods of determining sulfur are better known and hence will only be mentioned. Sulfur may be determined in heavy oils by the bomb methods (oxygen, eschka mixture, or sodium peroxide) and a shorter modification[5] which employs benzidine hydrochloride and sulfate solutions. Sulfur can always be determined by burning in a combustion tube and train—and in the lighter oils (and gases) by the A.S.T.M. lamp method. The different types of sulfur derivatives can be determined in samples that will burn properly in the standard A.S.T.M. lamp or the Ethyl corporation lamp, by utilizing various reagents for each type of compound.[6]

The Tutweiler[7] method of determining sulfur in gases is widely used although precipitation with chemicals such as acidified cadmium chloride[8] or silver sulfate[8] are being more and more frequently mentioned.

Liberation Methods

Although analytical methods such as those listed above are useful and necessary in interpreting plant conditions, they do not give a direct measure of the severity of corrosion. In fact, no completely satisfactory methods of measuring corrosion propensities have been developed. However, more and more attention is being given to laboratory distillation tests, etc., by which the harmful materials such as hydrogen sulfide, hydrochloric acid or sulfur dioxide are liberated and subsequently determined by chemical methods. The value of such methods is vitally dependent on empirical correlation with actual results in the plant and this type of correlation has not as yet been studied extensively.

About all that has been reported in the literature are the two procedures proposed by Davis, Jones and Neilson.[5] The method of determining hydrochloric acid consists essentially of a steam distillation and an analysis of the gas and condensed water solution for acid. A modification of this method for also determining hydrogen sulfide liberation, involves steam distillation of the oil in the presence of potassium hydroxide solution. The determination of sulfur dioxide liberation from acid treated distillates is also a distillation experiment in the presence of caustic.

It would seem that such tests would simulate plant conditions much more closely than plain chemical analysis. If such tests are conducted regularly in connection with plant operations, then in time the results of the tests may become significant as a criterion of plant corrosion difficulties and provide our first real step in controlling corrosion.

References

1. Matthews—Ind. Eng. Chem. 13, 325 (1921).
2. Hawthorne and Bedell—Refiner and Natl. Gaso. Mfg., page 260, June, 1938.
3. U. O. P. Laboratory—Test Methods for Petroleum and Its Products—1937.
4. Puckett—The Oil and Gas Journal, page 44, Sept. 23, 1937.
5. Davis, Jones and Neilson—The Oil and Gas Journal, page 62, May 26, 1938.
6. Faragher and others—Ind. Eng. Chem. 19, 1,281 (1927).
7. Gas Chemists Handbook, 3rd Edition, page 463, Am. Gas Assoc., New York.
8. Devine, Wilhelm and Schmidt—Bur. Mines Tech. Paper 560, page 3 (1933).

Design of New Filtrol Fractionation Plant

By M. M. MOORE and H. M. GWYN
Standard Oil Co. of California Filtrol Corp.

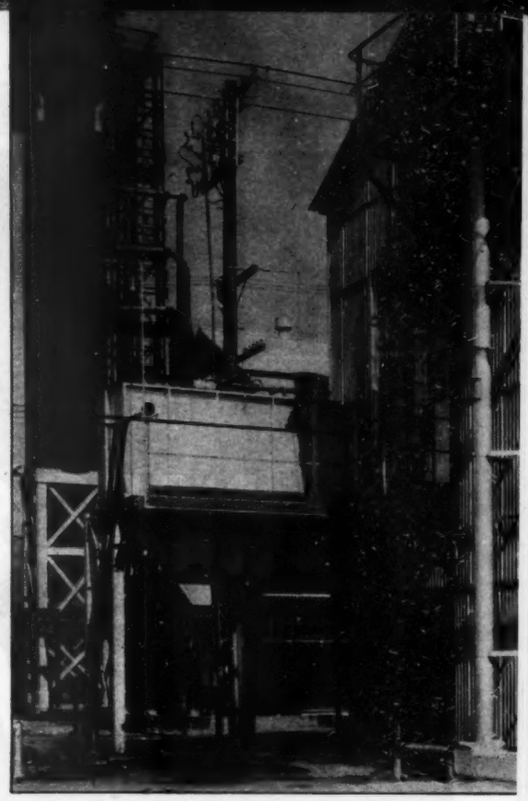
Filtrol fractionation is the name of the process in which Super Filtrol, a finely divided bleaching clay, is injected into a hydrocarbon oil stream as it flows to some form of fractional distillation equipment. The purpose of this relatively new technique is to combine fractional distillation and contact clay decolorization into a single and more economical continuous process. The process has attracted considerable interest for some years, but had not reached its most successful stage of development until it was applied in connection with the vacuum distillation of treated long residuums. Recently the Standard Oil Co. of California installed a Filtrol fractionation plant at its Richmond refinery, and it is the purpose of this paper to describe briefly this installation. Factors which make the Richmond installation a definite advance in the art of finishing lubricating oils are careful control of contact time and temperature, steam stripping and continuous filtering of the products, and completely automatic clay handling.

Equipment Used

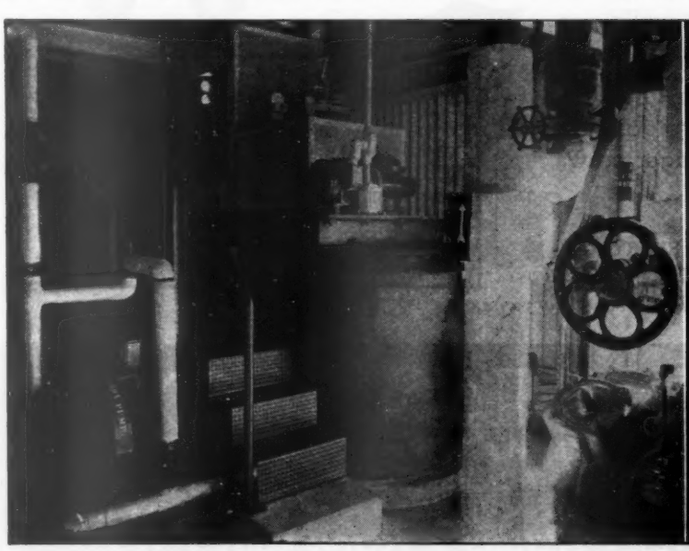
Essentially the Richmond installation is a lube oil vacuum rerun unit having those modifications necessary to efficiently employ Super Filtrol in the operation. The plant is capable of charging 1,200 bbls. a day of solvent treated long residuum, and the products of the operation are three pale oils and a 5 A.S.T.M. color bright stock, all of which are completely refined products requiring no further treatment. The rerun unit consists of a heater containing 2¾-inch and 3½-inch O.D. tubing which has a total heating surface of approximately 800 square feet; a 67-foot tower, the upper part of which is 9 feet in diameter and contains 13 bubble plates—the lower section is 5 feet in diameter and serves as a reservoir to permit required contact of oil and clay; heat exchangers; control equipment; pumps; lines and tanks. Other equipment consists of a 100-ton clay storage bin, automatic clay conveying, proportioning and feeding system; a totally enclosed continuous rotary vacuum filter, the drum of which is 5 feet 3 inches in diameter and 6 feet long, and a vacuum pump.

Operation of Plant

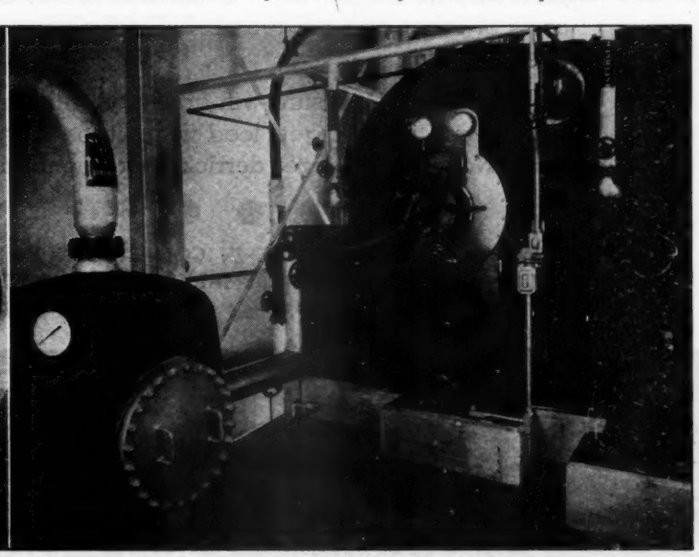
As indicated in the flow sheet, about 10 per cent of the charge to the furnace is continuously by-passed through a 3-foot by 4-foot clay mix tank. This tank is equipped with a mechanical agitator which mixes the clay with the oil, thus forming a readily pumped oil-clay slurry. The clay is automatically fed to this tank by a gravimetric feeder which is adjusted according to the degree of clay treatment desired. The small clay hopper of this feeding device is kept automatically supplied by a scroll-type conveyor which takes clay from the 100-ton overhead storage bin into which clay is delivered in carlots from a nearby railroad siding by means of a vertical and horizontal unit conveyor. The by-passed oil containing clay rejoins the main flow as it continues on through the overhead, No. 3 cut and bottoms heat exchangers before entering the furnace. On the present stock a heater outlet temperature of approximately 675° F. is maintained. The oil-clay slurry then enters the vaporizer section of the tower. The operating conditions in this section of the tower are so adjusted that vaporization of the more volatile portions of the charge leaves behind a bottoms product of bright stock viscosity. The unvaporized portion which also contains all of the clay, passes over a number of stripping trays before falling into the soaking section. The lighter cuts thus receive a light clay treatment in passing through the exchangers and furnace and the clay charge is greatly concentrated in the bright stock which requires heavier clay treatment. The vaporized material is fractioned into the three previously mentioned pale oils which are taken off as side streams from the tower. Each cut passes through a steam stripper which eliminates all undesirable odor and insures color-stable products. A small fraction approximating gas oil is refluxed as a means of controlling the temperature at the top of the tower. This reflux, which in the first month of operation amounted to only 2 per cent of the charge, is continuously removed from the system. The only other loss of product is the oil



General view of 1,200-bbl. per day plant equipment with clay building and conveyor in foreground and heater and tower in left background



Continuous vacuum filter and filtrate receiver; clay storage bin in the background



Automatic clay weighing, gravimetric feeding, and mixing equipment in background; part of the vacuum pump in right foreground

Mr. Oil Producer...

this unique *Split-rubber principle* of the

MISSION VALVELESS SWAB

assures you...

3 TO 15 TIMES FASTER SWABBING *with* SAFETY

WHY FASTER: Entirely different design from conventional type swabs. No ball and seat to choke the flow of fluid and retard the fall. Movable half of split rubber moves upward allowing an unrestricted fluid passage.

ADVANTAGES OF FAST SWABBING: 1. Earns quicker profits by getting oil into the tanks faster. 2. Cuts down costs of labor and rig rental. 3. Swabs more wells per day.

WHY SAFER: Gas pressure will open split rubber allowing gas to by-pass, resuming its load without loss after gas has passed. **No loose line over derrick floor to endanger crew.**

● ● ●

OUTSTANDING RECORDS MADE IN COMPETITION IN EVERY OIL COUNTRY HAS RESULTED IN REMARKABLE INCREASE IN SALES

DOWN STROKE: Note that movable half of each rubber has risen above stationary half . . . allowing an area for fluid passage much larger than that of conventional type swabs.

UP-STROKE: Note that movable half of each rubber has dropped back beside its other half. Rubbers now in swabbing position.

Sold through Supply Stores Everywhere

MISSION MANUFACTURING CO.
HUMBLE ROAD, HOUSTON, TEXAS
EXPORT OFFICE: 30 ROCKEFELLER PLAZA, NEW YORK

• SLIPS • VALVES • PISTONS • PISTON RODS • SWABS

which remains in the clay which amounts to less than 1 per cent of the oil charged.

The bright stock oil-clay slurry in the soaking section of the tower is agitated and stripped by the exhaust steam injected at the bottom of the vessel through a sparger, or perforated circle of pipe. As the operation is continuous, the soaking time, or more familiarly, the contact time, is regulated by automatically controlling the liquid level of the oil. Fifteen to 20 minutes time has given satisfactory results thus far. The slurry then passes through the bottoms exchanger and into an insulated surge tank from which the continuous filter is fed. Slow pump circulation is maintained on this tank to prevent the clay from settling to the bottom.

Continuous Filter

The continuous vacuum rotary drum filter used represents a relatively new development in fine clay filtration plants. The Monel metal cloth which forms the drum's surface is first precoated with a 3-inch layer of diatomaceous earth. It is this coating which performs the filtration, the clay being retained on the surface. The precoating operation is accomplished by circulating a small quantity of a light oil from a 4- by 6-foot tank equipped with a mechanical agitator to the vat of the filter in which the drum revolves, through the drum and back to the tank. The diatomaceous earth is gradually fed to the precoat mixing tank and as circulation continues the earth is deposited on the filter drum. Vacuum is maintained on the drum by means of a motor-driven pump. The oil level in the filtrate receiving tank is controlled automatically at approximately 1 foot, thus preventing oil from being drawn into the vacuum pump. The precoating operation is required but once a week and takes about three hours. As soon as the desired thickness of precoat has been applied, the filter is charged with bright stock containing clay from the surge tank. Filtration is continuous, a finished bright stock being produced. As the filter drum revolves picking up the spent clay and allowing the oil to filter through and pass to storage, a knife edge moves in against the precoat. This strips off the clay and cuts off the precoat at the rate of .0004 inch per revolution. The drum has an area of 100 square feet and, operating at 300° F., has successfully filtered 500 bbls. of the bright stock per day. This figure, however, does not represent the capacity of the filter since it can be increased considerably by speeding up the rotation of the drum, increasing the precoat cut or raising the temperature of operation. The filter is equipped with a spray system for washing off the last trace of precoat before beginning another cycle. The clay is prevented from settling out in the bottom of the filter vat by a paddle agitator. The spent clay and precoat material from the knife edge is continuously removed by a scroll conveyor which empties into a hopper. The rerun, clay contacting and filtration equipment is operated by two men per shift, one of whom is assigned to the distillation equipment. The operating costs show the expected saving as compared to the cost of separate rerunning and filtration by contact or other means.

The following are typical of results obtained, when Super Filtrol was being added at the rate of 0.125 pound per gallon of charge.

	Charge oil	No. 1 cut	No. 2 cut	No. 3 cut	Bottoms	Overhead slop or gas oil cut
Gravity, A.P.I.	28.9	33.9	31.4	31.1	27.2	31.1
Flash, C.O.C.	435	350	405	485	595	220
Viscosity, S.S.U. at 100° F.	400	75	174	421	2615	46
Viscosity, S.S.U. at 210° F.	58.1	37.3	44.6	59.3	151	....
Viscosity index	98	...	95	98	93	....
Color, A.S.T.M.	4	1	1	1½	5	....
Color hold (after 16 hours at 210° F.)		1½	1½—	1¾—	6	....
Pour	+10	+10	+10	0	0	....
Carbon residue	.08	0	0	.01	.30	....
Neutral number	.10	.03	.03	.03	.03	....
Yields, per cent	100	5	25	43	25	2

In addition to the above the bloom or outer tone of each finished product is of a very desirable nature. The bright stock in particular has a good velvety green color when seen by reflected light.

Other Applications

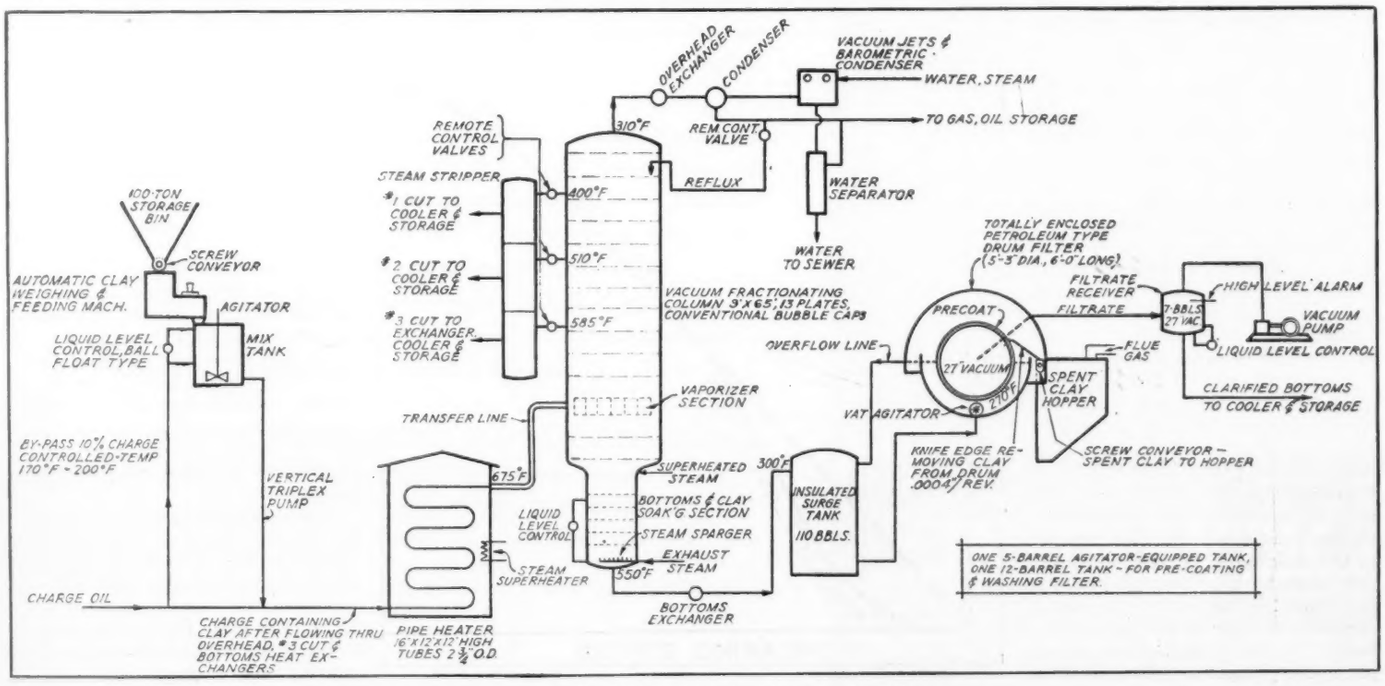
It may be of further interest to point out that Filtrol fractionation can also be used to advantage in a number of other stages of lubricating oil refining. For example, it can be employed on solvent mixtures of lubricating oils which have been made up to facilitate other refining steps, as in the case of naphtha solutions prepared in connection with centrifuge dewaxing. In this instance, after centrifuging, conventional practice calls for a naphtha stripping operation followed by decolorization with bleaching earth. By employing the Filtrol fractionation principle, both of these latter operations can be accomplished simultaneously. Again, crude oils containing but small amounts of asphaltic material, and those in which the asphaltic content has been materially reduced, can be refined by this process. Such units produce better quality naphthas, kerosenes and intermediate fractions, in addition to finished lubricating cuts of the desired color. Sour or neutralized long residuums which are being subjected to vaccum distillation and clay finishing appear to be another ideal phase where this process can be profitably employed. No doubt other applications will occur to readers familiar with the detailed refining steps of individual plants.

$100,000 For Welding Research

A program of research and investigation of welding procedures and techniques in which scientific leaders and technical universities will cooperate has been announced by the welding research committee of the Engineering Foundation. An appropriation of $100,000 has been made to finance the program.

The study is considered to be of major importance in view of the rapidly increasing use of welding in the petroleum, heavy goods and building industries which are using an ever-widening range of alloy steels in construction work.

The number of cycles of repeated stresses which the various type joints can withstand under the loads which they will be required to carry is being studied at the University of Illinois at the present time.



Simplified flow sheet, Filtrol fractionation plant, Richmond, Calif.

Technical Control Required in the Manufacture of Greases

By W. A. LUTZ, H. A. AMBROSE and W. A. GRUSE
Gulf Research & Development Co.
Mellon Institute of Industrial Research

First half of paper presented before the Lubricating Grease Institute. In this portion the authors discuss basic conditions, structure of greases, and consistency. In the second half, to appear February 16, the subject will cover bleeding and oil separation, chemical stability, tests for oxidation stability, specifications, and service.

Somewhere in our literature is an observation that there is no earlier sign of decadence for a science or an art than that of beginning to be meticulous about its own history. If that is true, then lubricating grease manufacture is still far from decadence, for it is doubtful whether we know when or where greases in the modern sense were first made. The case of axle lubricant for the chariot of Yua and Tii, from the Egyptian middle empire (1800-1400 B.C.), sometimes described as a lime-soap grease, is almost certain an example of tallow contaminated by sand and the alkali dust of a dry climate. It is more probable that soap greases came to light in the ferment of new technical ideas which boiled up during the industrial revolution, say about 150 years ago. Progress was slow and is still slow. In fact, if progress generally follows the S-shaped curve of a cubic equation, then we are probably just beginning to mount from the initial flat area into the foot of the secondary period of rapid advance. Under these circumstances, it seems worthwhile to pause and observe where we stand, even at the cost of repeating the obvious.

Basic Conditions

The fact that lubricating greases are semi-solid or solid materials accounts for their usefulness in lubricating certain bearings. In general, where flood lubrication is not required because the heat generated is not great enough to call for a liquid which will act as a heat transfer medium, greases have been found particularly suitable. Unfortunately, very little is known as to the fundamental nature of the elements contributing to consistency so that greases are usually selected for various applications according to previous experience.

Table 1 summarizes speed and temperature ranges to which grease is subjected in lubrication service.

There are various reasons why grease is preferred to oil for any particular application, but the principal one is the condition of design or service which renders frequent supply of lubricant difficult or impossible.

A sketchy picture of the way a grease performs its function is somewhat as follows: Because of its semi-solid consistency, a more or less tenacious film of grease is readily established between the moving surfaces. A properly chosen grease will have a melting point somewhat above the operating temperature; likewise the consistency must be such that the film will hold together against the operating pressure. In cases where the pressure breaks the film or nearly does so, the increase of temperature consequent on slightly increasing friction will soften some of the grease near the rubbing surfaces, so that a film of oil or fluid grease may flow between them. In this way solid grease in a static position near the working surfaces, acts as a reservoir and supplies more lubricant when it is required. Likewise, grease not actually in service may collect at the ends of the bearing system in a relatively cool zone, forming a seal to prevent the entrance of extraneous material such as dust or water.

The selection of grease as to consistency depends obviously on bearing design and service. In many light, high-speed installations, where fractional loss is not desirable, a relatively solid product which channels in place is useful. In a ball bearing, for example, a channeling grease will form a ring adhering to and rotating with the ball retainer. Since there is essentially no internal shearing or working of the grease, the bulk of the friction is the relatively small amount developed in the thin film on the balls and race. In comparison, semifluid greases will flow readily against the moving parts, to be churned and worked during the operation. Such a lubricant may be necessary to carry the imposed load, but internal friction will be high.

The starting torque of the grease-lubricated bearing is of some importance, particularly in cold climates or in apparatus where a high starting torque will cause disturbances in the system. For example, if a textile spindle bearing were lubricated with a grease having a high starting torque, belt slippage might occur, causing breaking of the textile threads. The starting torque of grease appears to be dependent upon the freezing point of the oil from which it is made, moderate variations in soap content having little influence at low temperatures. Greases to be used in bearings at low temperature apparently should be low in water content in order to avoid freezing and formation of ice crystals which would increase internal friction. The running torque of a grease may be important where a large number of units is connected into one system, since power consumption will be affected. A channeling grease would offer advantages in such a case.

Significance of Melting Point

While the melting point determines the highest temperature at which a grease may safely be used, the relation should not be taken too literally. A lime soap grease may melt at about 200° F., but it will not, in general, function properly above, say, 160-180° F., because water essential to its structure will be lost at any higher temperature. While this consideration does not apply with the same force to mixed base and soda soap greases, it is still true that experience is the best guide in relating melting point to possible service.

The usefulness of a grease may be limited, not only by its consistency and melting point, but also by its mechanical and chemical stability. It is not unusual to expect almost continuous operation of a greased bearing for several months without renewal of lubricant and at temperatures as high as 265° F. It is obvious that a very high stability is required to meet these severe requirements.

Attempts to set up a theory of grease consistency cannot be very successful without taking into account the nature of grease structure and much progress in clearing up either field is hampered by a very great lack of information. A little help may be obtained by considering the analogy with aqueous solutions of soaps. It is known from

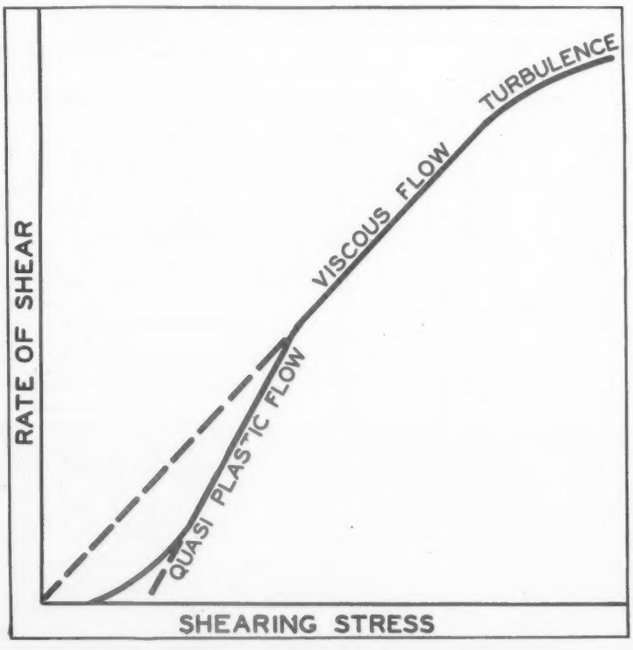
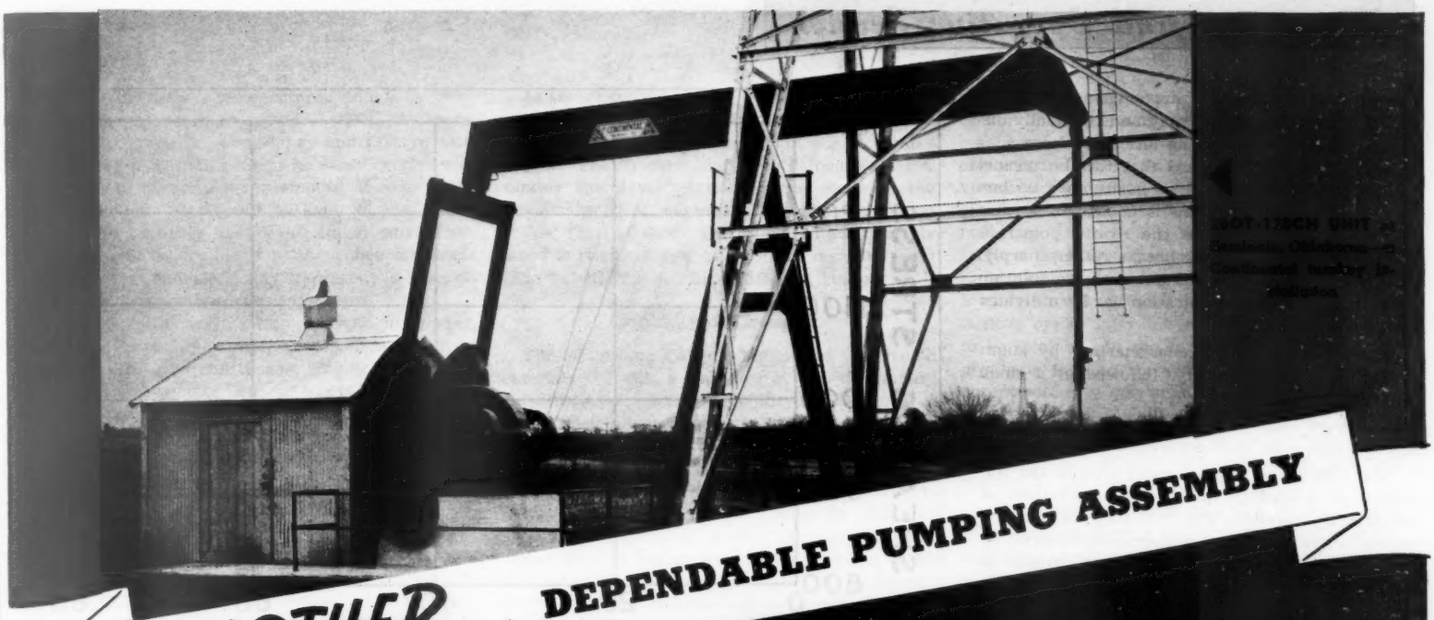
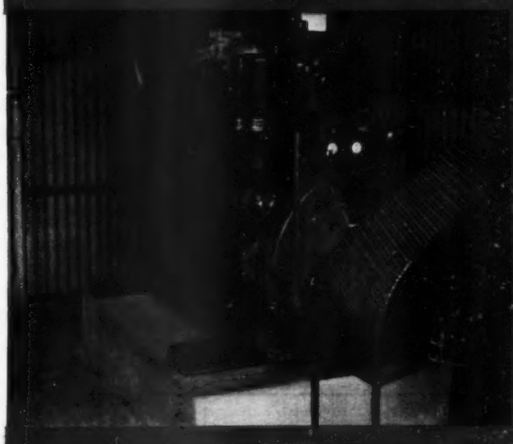


Fig. 1—Possible types of flow for greases



ANOTHER... DEPENDABLE PUMPING ASSEMBLY

CONTINENTAL-FALK
26OT-128CH Geared Pumping Unit
CLIMAX BLUE STREAK
N-4-B Pumping Engine



Modern in every respect and with no detail overlooked to insure long, trouble-free operation, the Continental-Falk 26OT-128CH Geared Pumping Unit, powered by an N-4-B Climax Engine, provides another dependable assembly for economical pumping.

Centralized lubrication, rigid structurals, an extra wide main base and a safety basket are features of the 26OT-128CH unit. Modern counterbalancing is provided with the Emsco-Slonneger (short-radius) Counterbalance which remains in adjustment regardless of changes in stroke length.

The Climax pumping engine, with automatic safety devices to protect against low oil pressure or high water temperature, has extra heavy flywheels to give a smooth pumping cycle. Box base construction reduces vibration and provides an oil sump large enough to prevent early contamination of lubricating oil.

Continental's extensive experience in deep well pumping is at your command... Ask your Continental representative for recommendations in solving your pumping problems.

THE CONTINENTAL SUPPLY COMPANY

General Offices • Dallas, Texas

Export Office: CONTINENTAL EMSCO CO., Inc.
30 Rockefeller Plaza New York City, N. Y.

Representatives:
LONDON TRINIDAD MARACAIBO TAMPICO BUENOS AIRES

CONTINENTAL

"SERVING THE OIL AND GAS INDUSTRIES"

the work of McBain that hot aqueous soap solutions contain both molecularly and colloidally dispersed soap molecules. The latter are known as micelles, and it is supposed that for the normal case, about 30 soap molecules go to make up one micelle. If such a solution is cooled, it reaches a temperature (known as the Krafft[1] point) at which the solubility curve breaks rather sharply, most of the soap separates out, and the solution becomes solid. This solidification has been divided by Lawrence[2] into:

1. A soft soap stage, characterized by slight opacity and high viscosity, followed at a small temperature interval by

2. A hard soap stage, at which marked opacity appears and solid soap separates.

The first stage is presumably due to the formation of secondary micelles by association of the primary micelles. The first stage can be prevented or its formation temperature lowered by the addition of peptizers, aniline and various alcohols.

Three Stages Used

The analogy has been carried over to oil systems by Lawrence[2] who suggests that three stages can be considered:

1. True solution, with viscosity only a little higher than that of the oil—this exists at comparatively high temperatures.

2. True gel, a stable, transparent, elastic and homogeneous system—this forms on cooling the solution under (1).

3. Paste of oil and crystalline soap—at sufficiently high soap concentrations, the paste will be rigid enough to show the characteristics of a plastic solid.

If we use the analogy still more, it can be assumed that in true solution, such part of the soap as is micellar in character is distributed in primary micelles of small size. For Stage 2, association to secondary micelles seems reasonable, and at Stage 3, crystallization will have occurred. Except for Lawrence's own rather sketchy work, this outline has, so far as known, no experimental support. Our own experiences with soap-oil mixtures of low concentration has indicated that at low water concentrations, true solutions of soaps in oils can be made, showing no recognizable increase in viscosity. These do not form gels on cooling to any temperature within the range down to 0° F. The same soap mixtures with a water content of the order of 0.5 per cent (based on the soap present) form true solutions at high temperatures and go into a gel structure on cooling, as indicated by anomalous viscosity phenomena. Evidently Lawrence's outline will require some limitation before it fits all the phenomena involved.

The conventional greases are presumably not homogeneous gels, because the concentration of soap in the medium is too high for this form to remain stable. Crystallization occurs, leaving the limiting concentration of soap in oil as a gel which supplies a framework for the now insoluble soap crystals. The exact nature of this framework is uncertain; for soda-soap greases it is likely to be a mixture of fibers, while for lime-soap mixtures it has been pictured as a cellular structure (something like a honeycomb), enclosing the liquid oil present.

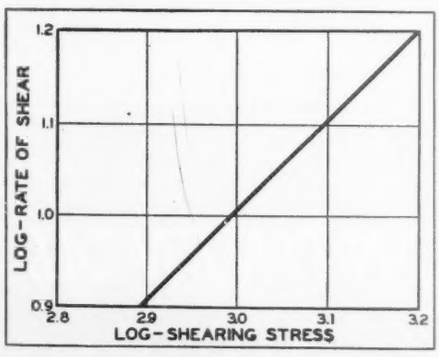


Fig. 3—Rate of shear vs. shearing stress for a grease as measured in a rotary viscometer

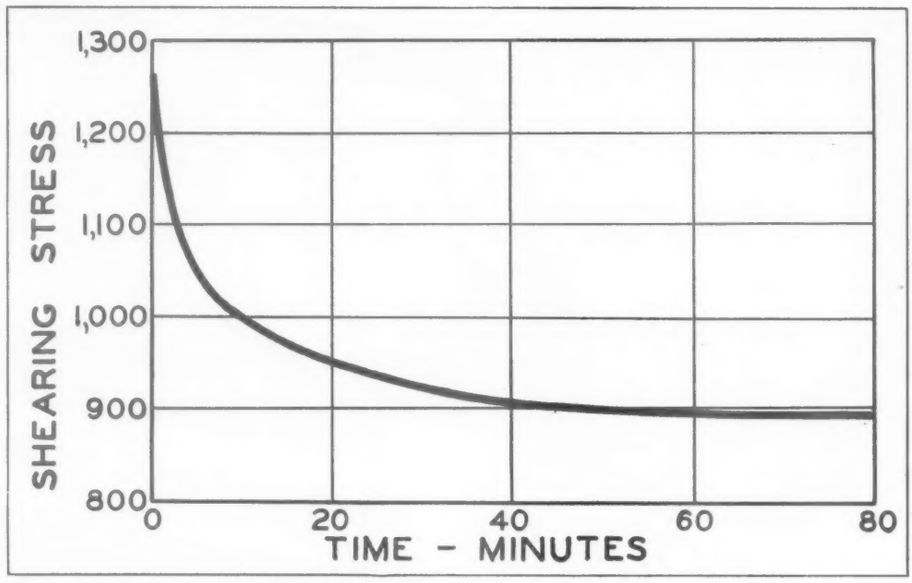


Fig. 2—Effect of working on the consistency of a grease

TABLE 1—SPEED AND TEMPERATURE RANGE FOR GREASES

Speed	Temperature		Example
High—4,000-40,000 r.p.m.	High	175 ° 400° F.	Fans, rolls
	Medium	40 – 175 °F.	High-speed grinders
	Low	—40 —+40 °F.	
Medium—500-4,000 r.p.m.	High	175 – 400 °F.	Aircraft rocker arms
	Medium	40 – 175 °F.	Line shaft bearings
	Low	—40 —+40 °F.	Outdoor hoists, cranes, etc.
Low—0-500 r.p.m.	High	175 – 400 °F.	Cement kilns
	Medium	40 – 175 °F.	Ball mills
	Low	—40 —+40 °F.	Aircraft control bearings

The state of the oil in a grease, as well as of the water, glycerin and fatty acids, offers many puzzling questions. That some of the oil, at least, is held very loosely, is indicated by the ready squeezing out which occurs when a sample is pressed between filter papers held between blotting papers, as in Herschel's[4] suggested device for measuring bleeding. The fact that loss remained constant after say 20 minutes, it evidently related to the time required for the oil to migrate out of the grease and into the blotting papers. Herschel's figures did not show any limit to the loss, since increase in pressure caused a gradual increase in oil removed. This subject has been studied again by Farrington and Humphreys;[5] they recognized for the several types of grease examined an ultimate loss, for the given temperature and pressure, but steady though diminishing values of loss for increasing pressures.

According to McBain,[6] the solvent in a gel is held in two ways:

1. By direct combination or sorption of solvent molecules, or groups of such molecules, by exposed attractive groups on the gel-forming molecules.

2. Penetration of free molecules of solvent between the interlacing structure in order to relieve strains existing in the nonsolvated framework.

The forces of adsorption are ordinarily so located and of such magnitude that direct expulsion of adsorbed solvent molecules from around the center of activity say the COO-metal group of a soap molecule—by pressures of the order of two or three atmospheres is hardly to be anticipated. We have no present way of estimating the magnitude of the strains in a partly desolvated gel, but it is more within expectation that these would be nearer the figures mentioned. If solvent molecules are held in a gel network to relieve strains, then the imposing of outside pressure equal in magnitude to the strains can be pictured as expelling the oil. In fact, assuming the mechanism, the amount of outside pressure required to expel oil could be regarded as a measure of the strain which the presence of solvent relieved; furthermore, the proportion of oil held by each of the two suggested means might be estimated by comparing the amount removable by pressure with that removable by use of an extraneous solvent, such as carbon tetrachloride, which will disintegrate the grease.

Properties of Greases

So far, we may picture a lime soap grease as made up of a soap-oil gel carrying as much firmly adsorbed oil as it can, swollen by still other oil, which is held in the gel structure with varying but lower degrees of firmness, the whole carrying (depending on concentration) a mass of soap crystals, which will be large or small, fibrous or clustered, as determined by composition and manufacture. It is desirable to provide in this mechanism for water and glycerol. Soda greases can be substantially anhydrous, and greases made from fatty acids may be substantially glycerol-free. However, the conventional lime-soap grease will contain both; since they are miscible, the two might be together. It has been customary to say that a lime-soap grease is an emulsion in which the water is dispersed in the oil phase. While this is probably true for such greases when made with high water content, there is, so far as we know, no experimental proof of an emulsion structure when water content is properly adjusted. Lawrence's suggestion is that water and glycerol serve as peptizers for the soap, low-

ering the transition temperatures and thus rendering the soaps more soluble. Obviously, considerable changes in consistency and texture can be effected if a small change in water or glycerol content will render a given amount of soap more or less soluble. It should be kept in mind that water can probably be present in an emulsified form as well as combined in the above manner; perhaps the emulsion may represent a poorly made and nonhomogeneous type.

Excess fatty acids, often present in grease mixtures, probably combine with neutral soap molecules to give acid soaps, like those known in aqueous systems. An off-hand guess would be that since these contain less metallic element and more hydrocarbon radical per complex than do the simple soaps, they would be more soluble in oil. Again a definite change in grease properties could be predicted if a small addition of fatty acids would render the soap more soluble.

The marked effect of high temperature on greases can easily be understood if it is remembered that gels are easily melted and that we are postulating gels for many greases. The fact that a soda-soap grease is often nearly anhydrous and at the same time high-melting, fits in well; our experience, mentioned above, was that a water content was required for gel formation. Thus, an anhydrous grease might be poor in the low-melting gel constituents and rich in the higher-melting insoluble soap.

The disintegration of lime-soap greases by sufficient heating to lower the water content is presumably tied up with the effect of combined water on soap structure. The driving off of water would raise the transition temperature and lower the solubility of the soap, thus breaking up the structure of either the fiber network or the cell-wall, and releasing the oil held in either. The irreversible changes suffered by lime-soap greases on heating support this view.

The state of the insoluble soap in grease has been considered by Farrington and Davis,[7] who found that the soap fibers in different grease types varied from 1 mm. to a fraction of a micron in length, or even smaller, with a definite relation between fiber length and grease properties. Continued heating and agitation shortened the fibers.

The structure and mechanical stability of a grease will be influenced by whatever really underlies the above speculations. At present, the best we can do is to set them up for comparison with the experimental work on consistency and stability, in the hope that ultimately a connection can be established.

Consistency

The consistency of a grease is commonly estimated by some type of penetrometer which does not measure in fundamental physical units. It is, however, possible to measure consistencies in fundamental units, expressing the results in terms of viscosity or mobility.

Wilson[8] suggested that the consistency of grease is determined by yield value, mobility, elasticity and texture. Porter and Gruse[9] measured yield value and mobility of a number of cup greases by extrusion through a short capillary. The flow of a plastic material through a capillary may be represented by Bingham's[10] equation:

$$\frac{V}{t} = \frac{\mu R^3}{4}(F - f) \qquad (1)$$

where

V = cubic centimeters flow through capillary
t = time in seconds
μ = mobility (same dimensions as fluidity)
R = radius of capillary in centimeters
F = total shearing stress in dynes
f = yield stress necessary to start flow

As shown by the data of Porter and Gruse, the rates of flow of grease through a capillary are linear with shearing force, except for low rates of flow. The "yield value" is obtained by extrapolating the linear portion of the curve to the zero axis of flow, neglecting the points obtained for low rates of flow. The "yield value" thus obtained is not real, and attempts to measure yield value directly meet with indifferent success.

Mobility of Greases

The nature of flow of plastic or thixotropic materials through a capillary is not thoroughly understood. Apparently mobility in Equation 1 is not independent of the radius of the capillary. If pressure is applied to a plastic or thixotropic substance, such as a grease, the nature of flow through a capillary may be complicated. It is possible that a real pressure must be exceeded before flow starts; it is also possible that the rate of flow at low pressure is so small as to be overlooked in ordinary laboratory experiments. As the pressure is increased from zero, the material is finally sheared at the walls of the capillary, and starts to flow as a plug, with no shearing in the main body of the material. With further increase in stress and rate of flow, shearing occurs in layers of material further removed from the capillary wall. Finally, at very high rates of flow, shearing may occur in the entire body of the material, and if the structure is broken down sufficiently flow will become quasi-viscous, the rate of shear being linear with the shearing stress, and a plot of rate of shear versus shearing stress can be extrapolated through zero. An idealized plot of this concept is shown in Figure 1. Data of this type have been recorded for fluids having anomalous viscosities.[11] It is probable that similar data could be obtained for very fluid cup greases, but viscous flow would be difficult to attain for harder greases.

In the case of fluids of the above type, it is also possible to extend the type of flow to turbulence.

As shown by Arveson[12] the apparent viscosity of a grease, as measured by extrusion through an orifice, varies with the rate of shear and at very high rates of shear (above 1,000,000 reciprocal seconds) approaches the viscosity of the oil from which the grease is made. If the apparent viscosity of the grease is plotted against the rate of shear, the curves become assymptotic to the viscosity-shear curve for the oil at high rates of shear. Rates of shear of the order of 1,880,000 may be encountered in journal bearings at a speed of 1,800 r.p.m. and a clearance of 0.0001 inch. The viscosity of a grease is shown to increase with soap content, and to increase as the temperature is lowered, as would be expected.

Arveson's data when plotted (rate of shear versus shearing stress) approach a similar plot from Bingham's equation, using the yield value determined experimentally.

A lubricating grease is not only plastic but is also thixotropic. This is qualitatively indicated by the fact that greases become softer when worked and penetration increases. The thixotropic property may be demonstrated by shearing a grease sample in a rotary viscometer, the outer cylinder of which rotates at constant speed (constant rate of shear) and the inner cylinder, suspended on a torsion wire, is free to swing through an angle, indicating the torque or shearing stress developed. The initial starting torque is quite high but immediately decreases as the grease is worked and becomes softer. Figure 2 illustrates the shearing stresses developed in a torsion viscometer operating on a grease containing 4 per cent calcium soap. The initial starting stress was 41 per cent higher than that obtained after equilibrium conditions had been reached when no further decrease in torque was observed. This period of reaching equilibrium covered a time of more than one and one-quarter hours. The capillary type of viscometer, as used by Arveson, is of interest in obtaining figures on the yield value or stress necessary to start flow, but is not entirely satisfactory for measuring viscosities or mobilities. Since the capillary used in such an instrument is quite short and the time of flow is brief, there is little opportunity for an equilibrium condition to be attained. In the short period in which the grease is flowing through the capillary, the apparent viscosity may undergo a substantial drop. The measured mobility of the grease will be somewhat lower than that of the fluid in actual service, since equilibrium conditions are not reached in the measurement.

If equilibrium conditions are obtained in a rotary viscometer,[13] it is found that a plot of the logarithm of the rate of shear against the logarithm of the shearing stress is a straight line, as illustrated in Figure 3

$$\Omega/\epsilon = mS^n \qquad (2)$$

where

$\Omega = 2$ (revolutions/sec.)
$\epsilon = (R_2 - R_1)/R_2 + R_1$

R_1, R_2 = radii if inner, outer cylinders
m, n = constants for the material
m = fluidity
n = slope of line for plot of log Ω/ϵ vs. log S
S = shearing stress

If the equation of flow of a thixotropic liquid in a rotary viscometer is converted to ordinary units of flow through tubes, the equation is obtained:

$$\frac{V}{t} = \frac{mnR^3}{n+3}S^n \qquad (3)$$

where

$S = \frac{PR}{2L}$

P = pressure in dynes/sq. cm.
L = length of capillary, cubic centimeters

For ordinary viscous liquids $n - 1$, and the equation becomes Poiseuille's law:

$$\frac{V}{t} = \frac{nR^4P}{8Ln} \qquad (4)$$

$\frac{1}{m} - n =$ viscosity in poises.

The rotary viscometer is, in effect, a journal bearing with relatively large and constant clearance. It is useful in investigating apparent viscosities of soft greases but has not been applied to hard greases. This type of viscometer is also useful in evaluation of softening or melting points for greases and petrolatums. The present method for melting points is a determination of the temperature at which a drop of semiliquid material falls from a thermometer, or from a thimble designed to hold a portion of the grease. Possibly, a more accurate measure of the softening and melting points can be made by evaluating viscosities over a temperature range on both sides of the approximate melting point. Above the melting point, the grease or petroleum becomes quite fluid and may behave as a viscous liquid, but when cooled to the hardening or melting point, the apparent viscosity increases quite rapidly with further drop in temperature. This method would be inapplicable to greases which decompose near their melting points.

Although the rotary viscometer is interesting as a research machine, it is too cumbersome to be very practicable for determination of melting

Here's why I use . . . PURCHASED ELECTRIC POWER

- First cost is lower . . . . .
- Operating, maintenance and labor cost is lower . . . . . .
- Fixed charges (taxes, interest, insurance, depreciation, etc.) is lower . . . . . .
- Greater efficiency . . . . .
- Dependable performance at all times . . . . . .
- Higher salvage value of equipment . . . . . .
- Equipment extremely portable .
- Quiet, clean and modern . . .
- Less down time, fewer repairs, smoother operation . . . . .
- Insures proved performance—thousands of units operated daily show greater NET economy . .

Ask YOUR Electric Power Company for more facts about Purchased Electric Power—especially how it can solve your power problems. There's no obligation on your part—

Here is one of thousands of wells which is being operated more economically by Purchased Electric Power. The average cost of Electric Power figures only 3% to 5% of the average selling price of the crude produced—a low production cost!

PETROLEUM ELECTRIC POWER CLUB

points. It may be possible, however, to develop a design suitable for investigating consistencies of petroleum greases and petrolatums.

At the present time, no method for studying flow and consistency properties of greases is in a satisfactory state of development.

The B.E.C. (bearing engineers committee) machine, used for studying the starting torque, running torque, and leakage of greases from grease-packed bearings constitutes a practical measuring instrument for grease consistency. It is of interest that hard greases often show the lowest running torques in this machine, due to the fact that the grease channels, a portion of it rotating with the ball retainer. This slippage would constitute a difficulty in measuring true viscosity in a rotary type of viscometer. There may be some question about the practical value of the theoretically correct viscosity measurements; they would, however, serve in developing a complete understanding of the factors making up consistency.

Bibliography

1. Krafft, H., Ber. 28, 2566 (1895).
2. Lawrence, A.S.C., Trans. Faraday Sec. 31, 193 (1935); 33, 329 (1937).
3. Lawrence, A.S.C., J. Inst. Petroleum Tech. 24, pp. 207-220 (1938).
4. Herschel, W. H., Proc. Am. Soc. Testing Materials 33, I, 343 (1933).
5. Farrington, B. B. and Humphrey, R. L., Petroleum Division, Am. Chem. Soc., Milwaukee, Sept., 1938.
6. McBain, J. W., and McClatchie, W. L., J. Phys. Chem. 36, 2567 (1932).
7. Farrington, B. B. and Davis, W. N., Ind. Eng. Chem. 28, 414 (1936).
8. Wilson, R. E., Proc. Am. Soc. Testing Materials 23, II, 453 (1923).
9. Porter, P. K. and Gruse, W. A., Ind. Eng. Chem. 17, 953 (1925).
10. Bingham, E. C., Fluidity and Plasticity, p. 225 McGraw-Hill Book Co., New York, 1932.
11. Ostwald, W., Kolloid, Z., 68, 2, 211 (1934).
12. Arveson, M. H., Ind. Eng. Chem. 24, p. 71 (1932); 26, p. 628 (1934).
13. Ambrose, H. A. and Loomis, A. G., Physics 4, No. 8, p. 265 (1933).

AIRCRAFT OILS

(Continued from Page 48)

bearings are used. Thus the corrosiveness of the lubricant is brought about by the addition of oiliness additives or by the oxidation of the lubricant itself to an acid during engine operation. Yet certain acids do not affect bearings.

Crude oils contain a natural inhibitor which is removed by the more drastic types of refining such as solvent extraction. Certain phosphite and sulfite additives have been used to check corrosion in lubricating oils but their chemical effect in aircraft engines especially in the presence of lead salts is unknown as the high piston ring groove temperatures met in aircraft service are quite different to automobile or truck operation.

The Underwood bearing-corrosion test machine has been quite useful in the study of the corrosion resistance. The bearing metals met with in aircraft engines are either the lead bronze used in Wright aircraft engines or the lead plated silver bearings of Pratt and Whitney engines so the Underwood tests should be made with these two types of bearing materials.

In the Underwood tests where 0.01 per cent Fe_2O_3 is added in the form of iron naphthenate the corrosion acceleration is from three- to six-fold. The Underwood oxidation rate increase where iron naphthenate is introduced is two to three times as great. Reports indicate where highly leaded aviation fuels are used cylinder liner corrosion is high. The resultant products are iron oxide and iron bromide which iron has an acceleration effect on the aircraft lubricating oil such as in the case in the Underwood corrosion test machine.

Oiliness

The piston ring scuffing in run-in of aircraft engines and the cylinder liner and ring wear caused by high B.M.E.P. have brought into use certain oiliness addition agents. There is a definite relationship between wear and oiliness. This is true even in straight mineral oils. The highest wear is with highly solvent extracted aircraft oils which have not been corrected through additives. When aircraft mineral oils are compared with those compounded with oiliness addition agents the ring scuffing on new engine break-in is six to one in favor of the compounded aircraft lubricating oil.

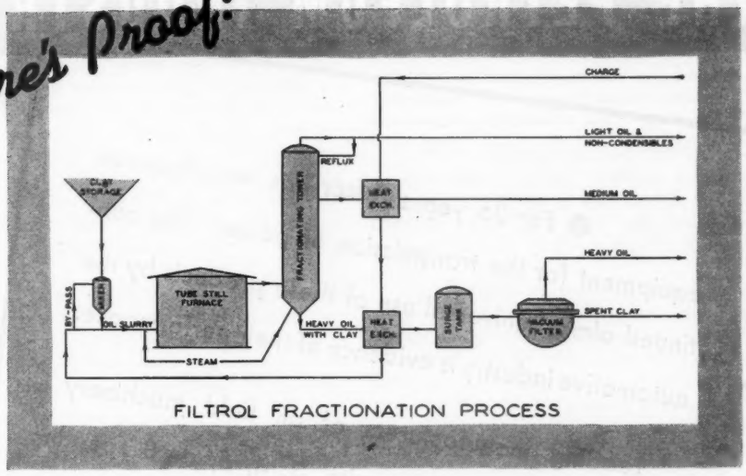
Chemistry of Oiliness

The several products that are used to compound aircraft oils come under the heading of ketones, esters, and phosphates. The ketones have proven to be very effective in greatly reducing ring wear and liner life. The corrosion of liners and lower blowby due to better ring seal are very noticeable and extended periods of complete overhaul are obtained. On the other hand, the phosphates have fused with the lead from the fuel and such lead phosphate salts deposit in the ring grooves and on the valve stems of the exhaust valves. Even though high-octane unleaded fuels are used white deposits of phosphoric acid are found especially in the exhaust ports. The real test for oiliness addition agents is in air flight services only as full scale dynometer tests do not show up all the chemical reactions that are met with in actual flight. More and more boundary lubrication under high pressures and temperatures is being met with in aircraft engine lubrication and the chemical oiliness relationship with

FILTROL FRACTIONATION SAVES IN BOTH EQUIPMENT AND OPERATING COSTS

IN LUBE OIL PROCESSING

Here's Proof:



FILTROL FRACTIONATION PROCESS

Just as crude distillation and cracking processes have been combined into single units, so Filtrol Fractionation brings together the former separate processes of fractional distillation of lubricating oils and the decolorization finishing operation. This development has resulted in several marked advantages.

First, this new type of unit will cost from 25 to 40% less than, for example, a distillation unit and a separate "contact" plant. Secondly, the upkeep, maintenance and operating costs are lower, since there is less equipment to service and less labor needed. The filtering load is greatly reduced since a large proportion of the charge to the unit is separated from the clay by vaporization. The elimination of a separate contact heater lowers the fuel bill to a minimum. Finally, it takes less time to put the oil through the system thus increasing the flexibility of the lube plant.

SUPER FILTROL

MAKES POSSIBLE
Maximum Decolorizing Efficiency
Maximum Filter Rate
Minimum Clay Requirements
Minimum Plant Equipment

PRODUCES
Greater Oil Recovery
Higher Quality Oils
Reduced Refining Costs

Filtrol Fractionation is primarily designed for use on lube bearing crudes, solvent treated and acid treated long residuals, dewaxed bright stock solutions and pressed oils.

License to use this patented process is automatically conveyed with the purchase of Super Filtrol—an outstanding activated bleaching medium.

A research laboratory fully equipped to make a study of your fractional distillation and decolorizing problems—without obligation—is maintained by Filtrol Corporation. Write for full information showing how Filtrol Fractionation will reduce your costs.

FILTROL

FILTERING MATERIAL FOR DECOLORIZING & PURIFYING

FILTROL CORPORATION

GENERAL OFFICES: 315 W. FIFTH ST., LOS ANGELES, CALIFORNIA
PLANTS: VERNON, CALIFORNIA; JACKSON, MISSISSIPPI

various metals, temperatures, and moisture vapors will have to be studied.

Chemical Reactions

From the foregoing it is clear to see that the lubricating oil in aircraft engines is in a state of chemical change from the time the oil is first put into the engine and even after the engine has been completely overhauled, as the adsorbed film of the cylinder liner, piston, and crankcase may contain chemical additives which will "poison" future fills of oil. No matter what is done in refining or what type of crude is used or additive for viscosity index, corrosion and oxidation correction or for oiliness, there is a decided chemical reaction taking place in aircraft engine service in flight. Increase the engine take-off power to flight time ratio or increase the cruising horsepower rate and the chemical reaction is more vital and detrimental. So take heed.

S.A.E. Specifies Temperature Ranges

There has, in the past, been considerable disagreement between automobile manufacturers individually, between oil companies individually, and between both industries collectively as to the temperature ranges in which oils of different S.A.E. motor oil classification should be employed. At the request of both industries, the Lubricants Division of the S.A.E. has given this question extensive consideration and has reached the conclusion there are four temperature ranges for which motor oils of different viscosities are needed:

1. When the lowest expected temperature is less than —10° F.
2. When the lowest expected temperature is —10° F.
3. When the lowest expected temperature is +10° F.
4. When the lowest expected temperature is +32° F.
5. When the expected daytime temperature is 90° F. or over.

These ranges, of course, correspond to very cold winter weather, normal winter weather, normal summer weather, and very hot weather. It must not be supposed that standardizing these four temperature ranges in any way suggests that four different oil viscosities are necessary to take care of all conditions for all equipment. This depends upon the design and construction of the engines, and also to some extent upon the nature of the oils employed. Of course the basis is the axiom that in relatively cold weather an oil characteristic of primary importance is its viscosity at starting temperatures, whereas in hot weather the viscosity of greatest importance is that at relatively high temperature, because it is this quality which influences oil consumption. Practically speaking, it is obvious that with this temperature set-up, two viscosities of oil will take care of most engines in any particular territory. In parts of the South the normal seasonal ranges would be for a minimum of 32° F. and for a daytime maximum of over 90°; whereas in territories where —10° is a normal winter anticipation, temperatures over 90° are usually most uncommon, whereas the two middle ranges cover by far the larger part of this country.

Examination of Fragmental Rocks

For those interested in the examination of mineral fragments, in bulk or in grain, a new book by Frederick G. Tickell, professor of petroleum engineering, Stanford University, holds much valuable information. This book, entitled "The Examination of Fragmental Rocks," contains information which can be applied to the study of cuttings and cores from wells. Geologists and petroleum engineers may now use the methods worked out by ceramists. A section on the optical identification of mineral grains can be used without a previous course of optical mineralogy, and the treatment described is practical rather than theoretical.

The book is divided into six chapters. The introduction is followed by a chapter on size analysis, then porosity and permeability methods are described, with the next chapter devoted to methods of preparing specimens. Identification of minerals and a description of minerals found in sedimentary rocks make up the last two chapters. The book contains a good bibliography and is well indexed.

"The Examination of Fragmental Rocks" may be purchased through the Book Department of The Oil and Gas Journal at the established retail price of $4, express prepaid (postage extra outside the United States), and a copy will be forwarded promptly upon receipt of check or money order for that sum. Where payment or company purchase order is not provided, the book will be sent c.o.d. to avoid delay.

ZENITH POOL

(Continued from Page 44)

such a big problem. The actual separation of the oil and water will no doubt require something beyond the settling process and the installation of the two treaters is an indication of future requirements.

For the gas-oil separation, one 12-foot by 36-inch separator is installed on each lease. Under present production requirements this is more than adequate but fairly large separators were required when open-flow potentials was the practice. Tank batteries vary from two 200-bbl. to six 200-bbl. welded tanks for storage. A 400- or 500-bbl. capacity, gun-barrel type, either welded or bolted, is generally installed for treating.

The low allowable naturally develops some production problems as it is impossible to pinch some of the wells down to where they will make a minimum gas-oil ratio on a 24-hour basis. For this reason some of the wells are flowed only for a short period each day or for a longer period a few days during the month.

Qualified to Serve

THE PETROLEUM INDUSTRY

● For 36 years Spicer has manufactured equipment for the transmission of power. The continued almost universal use of these products by the automotive industry is evidence of their performance.

Leading manufacturers of oil field machinery also equip with Spicer units. 3, 4, 5, or 8 speed helical transmissions, clutches, single and 2-speed power take-offs, top mounted power take-offs, couplings, universal joints and auxiliary transmissions —these Spicer products meet the test of service in petroleum production and servicing equipment.

Look for Spicer units as a sign of quality machinery.

Spicer Manufacturing Corporation · Toledo, Ohio

BROWN-LIPE CLUTCHES and TRANSMISSIONS
SALISBURY FRONT and REAR AXLES
SPICER UNIVERSAL JOINTS
PARISH FRAMES READING, PA.

QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph. D., Technical Editor

Essential Facts of Selden Patent and Why Not Now in Force

What are the main features of the Selden patent covering the automobile engine and why was the patent declared void?—G. H. K.

George B. Selden, a patent attorney with a scientific education, having graduated from the Sheffield Scientific School of Yale, applied for a patent in 1879, covering a "road engine." He caused a delay in the issuing of the patent for 16 years, it finally was granted in 1895. No commercial use was made of the patent and no motor car built according to its teachings until one was constructed for use as an exhibit during the litigation which lasted eight years. The Circuit Court rendered a decision in September, 1909, upholding the claims of Selden's patent.

Nearly every manufacturer, except Henry Ford and Thomas B. Jeffery, had taken out a Selden license in 1910 and 1911. The total of all royalties was estimated to amount to approximately $5,800,000 of which three-fifths went to the Electric Vehicle Co., holding the patent, and to George B. Selden, the remaining two-fifths was used largely for legal fees.

The Circuit Court of Appeals sustained the verdict of the lower court in a decision announced on January 9, 1911, but held that the Ford company had not infringed the patent. The patent was never declared void.

The essential principle of the Selden patent was held to cover only road vehicles propelled by the Brayton type of engine, in which the hydrocarbon fuel and air was compressed by an outside device before entering the cylinder; whereas the Ford car, in common with all others, was operated by an engine of the Otto type in which the reverse was true. If Ford had not infringed, those licensed under the Selden patent had not. This resulted in the dissolution of the Licensed Automobile Manufacturers.

Reference: The Automobile Industry, by Ralph C. Epstein.

Determining Hardness of Water by Soap Test and the Interpretation

How is the hardness of water determined and what is the meaning when shown in grains and parts per million? Is the method for making the test suitable for use in the field?—C. A. L.

The hardness of water may be expressed in terms of grains per gallon or parts per million of calcium carbonate, the reaction being 1 grain is equivalent to 17.1 p.p.m. The very soft, exceptional water contains about 50 p.p.m., nearly 3 grains per gallon, of calcium carbonate. A fair water in hardness tests up to 100 p.p.m., about 6 grains per gallon, while the very hard waters exceed 300 p.p.m., or close to 18 grains to the gallon.

The most satisfactory method for estimating the hardness of water involves the determination in a chemical laboratory of calcium and magnesium, then converting to the respective carbonates and finally stating the results in parts per million. While this is the accurate method, the time required is not warranted for routine inspection. The soap test, first proposed by Clark in 1841, is a rapid method, not requiring complicated apparatus, which is easily arranged for use away from a laboratory. The method depends upon the combination of calcium and magnesia with soap held in solution. When the cold original water is tested, the completed reaction indicates total hardness, then another test of the water after thorough boiling represents permanent hardness, the difference temporary hardness.

Two solutions, prepared in a laboratory, are required. A calcium solution made by slowly dissolving 0.2 gm. pure calcium carbonate in a few cc. of dilute HCl, then evaporating twice to dryness. The residue is dissolved in distilled water and diluted to one liter. The standard soap solution is made by dissolving dry castile soap, about 50 gms., in 500 cc. of 80 per cent ethyl alcohol. Let this stand for several days. This solution is diluted with alcohol until 6.4 cc. when added to 20 cc. of the calcium solution will produce a permanent lather. A quantity under 100 cc. of the soap solution should make one liter of standard soap solution for the test. The solutions are standardized as follows: Measure 20 cc. of the calcium solution, together with 30 cc. distilled water, into a 250 cc. glass-stoppered bottle. Then introduce, from a burette, the soap solution, 0.2 cc at a time, shaking the bottle after each addition, until the lather remains unbroken after standing, with bottle on its side, five minutes.

The test requires that 50 cc. of the water sample be measured into a 250 cc. bottle, then the standard soap solution run in at the rate of about 0.2 cc. at a time, shaking after each addition, until the lather remains as under the standardizing of the soap solution.

Once the standard solutions have been prepared, and the few pieces of apparatus are available, this method may be used in the field.

PARTS PER MILLION CARBONATE PER 1/10 CC. SOAP SOLUTION FOR 50 CC. WATER SAMPLE

Soap Solution	0.1 cc.	0.3 cc.	0.5 cc.	0.7 cc.	0.9 cc.
1.0	6.3	9.5	12.7	15.6	18.2
2.0	20.8	23.4	26.0	28.6	31.2
3.0	33.8	36.4	38.0	41.6	44.3
4.0	47.1	50.0	52.9	55.7	58.6
5.0	61.4	64.3	67.1	70.0	72.9
6.0	75.4	78.6	81.4	84.3	87.1
7.0	90.0	92.9	95.7	98.6	101.5

The water should be diluted with distilled water if more than 7 cc. soap solution is required for a 50 cc. sample.

Results are frequently stated in degrees. An English, or Clark, degree represents one grain per Imperial gallon, the U. S. gallon is one grain to each U. S. gallon, and French degrees means parts of 100,000. All as calcium carbonate.

Each degree of hardness will consume 1.7 lbs. of soap per 1000 gallons of water, which at 5 cents per pound, means a loss of 8.2 cents.

References: C. Bahlmann, Ind. Eng. Chem., 6, 209, 1914. Standard Methods of Water Analysis, Amer. Pub. Health Assn.

CHEMICALS FOR THE PETROLEUM INDUSTRY

Heptane
(Normal Heptane)

Use—Primary standard for knock rating of motor fuel.

Form—Colorless liquid.

Formula—$CH_3(CH_2)_5CH_3$.

Specific gravity—0.684 (75.4° A.P.I.).

Melting point, °F.—130.9.

Boiling point, °F. 209.

LIMITATIONS

Knock rating	—0.2 to +0.2
Freezing point, min.	°F 131
Boiling point, max.	°F. 209.6
Density at 68°F	0.6837 to 0.6839
Refractive index between	1.3877 and 1.38785

Differentiating Characteristics, Dyes and Colored Pigments

I am seeking some information concerning coloring matter and would like to have you give me the broad definitions of the differentiating characteristics of dye as compared with coloring agents produced by oxidation, such as chromate of lead.—G. W. M.

A dye is a substance used for the coloring of textiles, paper, leather, feathers, furs and other materials, by entering into the structure. Most dyes are soluble in water and organic reagents, such as alcohol. They are applied in the solution form.

A pigment is an insoluble substance, used in suspension for painting and printing. In a few instances pigments are applied as "dyes," the color compound being formed upon or within the material by chemical action; an example being chrome yellow which may be applied to cotton by the reaction of lead nitrate and potassium chromate. The cotton is first wetted with a solution. This treatment results in the formation of lead chromate, a yellow compound.

An exact, all inclusive, definition of a true dye would require a long and involved discussion of numerous chemical groups. A brief reference to a few may be of some help. Oxygen and nitrogen compounds are colored, whereas the companion hydrogen compounds are colorless. Benzoquinone, $C_6H_4O_2$, is yellow, but hydroquinone, $C_6H_4(OH)_2$, is colorless. Azobenzene, $C_6H_5N_2C_6H_5$, is yellowish red and hydrozobenzene, $C_6H_5NH.NH\ C_6H_5$, is colorless. It has been explained by Witt that a chromophor, color bearing group, must be introduced into the colorless aromatic hydrocarbons to render them capable of yielding a colored substance. Benzene, C_6H_6, is colorless but trinitro-benzene $C_6H_3(NO_2)_3$, is colored. The chromogene trinitro-benzene becomes the dye picric acid, or trinitro-phenol, by the entrance of the OH group to form $C_6H_2(NO_2)_3OH$. Dyestuffs are less colored than their salts, so strong colors are often produced with the aid of a salt forming compound. The dyes are generally aromatic hydrocarbons and derivatives. They may be classified according to chemical structure: Nitro-nitroso, hydroxyketone, azines, quinoline, etc., or by type of application—acid dyes, basic dyes, mordant dyes, etc.

The dyes used for the coloring of gasoline are those that are soluble in gasoline. They are very powerful and consequently used in relatively small quantities.

Reference: Knecht, Rawson and Loewenthal, A Manual of Dyeing.

PROBLEMS FROM READERS

Edited by L. G. E. Bignell

Brine Conditioning Systems

We have considerable salt water to dispose of and are interested to secure as much information as possible concerning disposal systems. Have you any information which will help us?—R. T. E.

You should be interested in a new report of investigation issued by the Bureau of Mines entitled "Typical Oil-Field Brine-Conditioning Systems Preparing Brine for Subsurface Injection." This report as prepared by Sam S. Taylor, C. J. Wilhelm and W. C. Holliman for the Bureau of Mines and the Kansas State Board of Health. The construction and operation of some typical brine-conditioning and disposal systems are described in detail. The data include the chemical and corrosive characteristics of brines before, during and after conditioning in various types of systems for subsurface injection. Closed, open and semiclosed types of systems used to condition hydrogen sulfide brines as well as the more stable brines containing iron in solution are discussed. The brines prepared for subsurface injection by the conditioning systems were produced with oil from four formations, namely, Arbuckle (Siliceous) limestone of the Cambro-Ordovician age, the Kansas City limestone and the Burbank sand of the Pennsylvania age, and the Wilcox sand of the Ordovician age. Each type brine presents special problems in brine-conditioning. The report contains complete description and histories of the brine-injection wells.

Brines are classified according to three types, (1) brines produced from limestone formations that contain relatively high concentrations of hydrogen sulfide and carbon dioxide, (2) brines produced from sandstone formations that contain carbon dioxide but no hydrogen sulfide, and (3) brines produced from limestone formations that contain carbon dioxide but no hydrogen sulfide.

The report covers descriptions of seven brine-conditioning systems of which five deal with the preparation of brine from the Arbuckle limestone formation.

Oil field brines are complex solutions usually containing 20 or more ionic components and an unknown number of ionic systems. Little specific information is available at this time concerning the equilibrium of complex concentrated aqueous salt solutions at various temperatures and pressures, especially at the high pressures existing in deep-seated formations.

The application of the ionic theory to complex solutions is beset with many difficulties, and consequently the present theory has been developed from results obtained with simple solutions. However, for convenience, a restricted ionic system may be chosen to study the effect of varying one or another of the external conditions. In Arbuckle limestone brines there exist in solution at least two gases, hydrogen sulfide and carbon dioxide, which affect the state of equilibrium of this brine.

The equilibrium expressions indicate that a relation exists between the bicarbonate, hydrogen sulfide, and carbon dioxide components of the raw Arbuckle brine. In like manner, it can be shown that a definite relation exists between the degree of alkalinity and carbon dioxide in brines.

To effect sustained subsurface injection of oil-field brines on both disposal and water-flooding projects, it is necessary to condition the brine in some manner so that no suspended matter is carried to or into the disposal formation or that subjected to "water-flood." In selecting the disposal formation, it is necessary, also, to consider the composition of the brine already present in the formation. Frequently, mixing of brines from different formations causes precipitation of dissolved salts. When dissolved salts are precipitated, the resistance to flow of brines into many formations increases until the wells either are plugged or their use is rendered uneconomical due to an excessive burden on the pump equipment necessary to maintain the desired rate of injection.

The general requirements of conditioning brine for subsurface injection can be met by either of two methods. In one method, which utilizes a closed-type system, all suspended matter is removed, but all components that might otherwise be precipitated are retained in solution. In the other method, which utilizes an open-type system, all suspended matter and all components that might result in suspended matter are removed.

The closed-type system has not been adopted generally as yet for conditioning brines for subsurface injection. The principal objection is that under ordinary circumstances it would be too expensive, if present known chemicals are used to counter-balance the large quantity of supersaturated carbonates usually found in brines.

The six essential features required for the successful application of this first method may be outlined as follows: (1) The entire collecting and injection system should be closed so that nowhere will the brine be exposed to the atmosphere; (2) at all times the brine should be conducted under as high pressure as practical, including its travel down the flow-string of the injection well; (3) complete separation of the oil and brine should be accomplished at the lease flow-tank, assisted if necessary, by an auxiliary separator; (4) the supersaturation of carbonates, if present, should be minimized by the addition of measured quantities of hydrochloric acid, carbon dioxide or hydrogen sulfide (no hydrogen sulfide should be added to brines of Types 2 or 3 for this purpose); (5) pressure filters should be used to remove all suspended matter from the brine; and (6) corrosion-resistant conduits should be used from the pressure filters to the injection stratum.

The open-type system requires for successful application the following: (1) Complete separation of the oil and brine should be accomplished at the lease flow-tank, assisted, if necessary, with additional separators; (2) hydrogen sulfide and carbon dioxide gases should be removed by aeration; (3) the supersaturation of carbonates should be removed by contacting the brine intimately with a calcium carbonate sludge long enough for the carbonate components of the brine to become stabilized; (4) the dissolved-oxygen content of the brine should be kept at a minimum; (5) the brine should be filtered to remove suspended matter, and (6) corrosion-resistant conduits should be used from the filter to the disposal stratum.

The report describes chemical methods for testing brines, methods for testing corrosiveness of brines and then describes in much detail brine-conditioning systems. Pictures and diagrams illustrate this portion of the report and several typical plants are covered in detail by the report. Five of the plants are located in Kansas with one in the Burbank field, Oklahoma and the other in the Edmond pool, Oklahoma.

The results of the investigations reported indicate the advisability of continuing the studies of the conditioning of oil-field brines for more efficient and economical injection into subsurface formations. Studies should be made of the engineering, geological, and chemical factors involved. More should be learned regarding the composition, chemical-equilibrium, and corrosive characteristics of brines.

The disposal of oil-field brines into subsurface formations is a comparatively new problem in oil-field operation. Although each plant discussed may rightfully be considered an experimental plant, the results of this investigation show that the following factors are of basic importance in the selection of type installation, and operation of brine-conditioning systems.

(1) In selecting the type brine-conditioning system, chemical and corrosion tests should be made.

(2) If the raw brines to be disposed of in subsurface formations are not highly supersaturated with carbonates or are undersaturated with carbonates, it is advisable to consider the possibilities of a closed system; conversely, if the raw brines are highly supersaturated it is advisable to consider complete chemical treatment.

(3) Brines supersaturated with carbonates can be disposed of, sometimes successfully, in relatively permeable subsurface formations; however the relative importance of the chemical characteristics of the brine to the physical and chemical characteristics of the disposal formation is still undetermined.

(4) Where complete chemical treatment of brines of high alkalinity is anticipated, it is advisable to consider reducing the alkalinity to approximately 100 parts per million or less to facilitate stabilization of carbonate constituents.

(5) For maximum efficiency, brine-conditioning systems should be operated continuously.

(6) In systems conditioning brine of high alkalinity and containing hydrogen sulfide it is advisable to use corrosion-resisting pipe between the filters and the injection strata. In fact, such pipe should be used with any brine unless tests show negligible corrosion characteristics to iron.

(7) A certain amount of continuous technical supervision is necessary in all brine-conditioning systems regardless of type.

(8) Where brines containing soluble iron compounds are conditioned in the open-type systems, chemical treatment to control hydrogen ion concentration (pH) is necessary to facilitate the efficient removal of the iron compounds.

(9) The dissolved oxygen content of brines should be minimized prior to injection into subsurface formations.

(10) The brines of high alkalinity containing either high or low concentrations of hydrogen sulfide, the dissolved oxygen content in concentrations less than 0.5 part per million apparently has no definite relation to the corrosion rate of iron.

FIELD OPERATIONS

Summarizing the Week's Developments

OKLAHOMA—A well outside the community block and east of production in the Ramsey pool, Payne County, cored saturation in Wilcox sand. Wildcats were started in the Newalla area, southeastern Oklahoma County, and near Hennessey in Kingfisher County, the second active test for that county. A 9,000-foot test offsetting the discovery well in the Oswalt area, Love County, was reported.

KANSAS—Drilling was started at wildcats in Leavenworth and Shawnee counties, in the Kansas sector of the Forest City basin. Leasing and geophysical exploration continued unabated in neighboring sectors of Kansas, Missouri, Iowa and Nebraska, in the basin. A wildcat in Section 7-21-11w, Stafford County, cored saturation in Arbuckle lime. The South Sittner pool, Stafford County, and the Kramer pool, Butler County, were extended.

TEXAS—The East White Point field in San Patricio County was extended 9,000 feet and oil was found in the Riverside gas field in Nueces County. Recently opened pools in North Texas area are receiving further development. A fourth distillate well was completed in the Opelika field in Henderson County. Another attempt is being made to extend the Talco field eastward. Cayuga producers may take a cut in price in order to get their full allowable production run. The starting of wildcat wells in strategic points featured West Texas news. The Foster pool in Ector County was extended eastward three-quarters of a mile. Tests are to be drilled in Borden, Dickens and Cochran counties in the north end of the Permian basin. In Central Texas the Griffin pool in Jones County and the Knight pool in Young County were extended, the first named extension starting at 165 bbls. per hour. In the coastal area the Ace field in Polk County took on new life by showing production in the deep sand at 7,235-55 feet. On the Louisiana side of the Gulf Coast fields a new pay was discovered in the Sweet Lake field in Cameron Parish, the first well starting at 350 bbls. of oil per day.

ILLINOIS—In spite of the highest water that has invaded the Illinois basin since 1936 the basin fields hit a new production peak with an average for the week of 137,865 bbls. The whole state produced 146,110 bbls. per day, a higher figure than it has ever reached before. Flood waters slowed operations and may do so again this week. High water invaded the basin fields in western Kentucky and Indiana.

MICHIGAN—In Bay County, eastern Michigan, Gulf Refining Co. on its large block developed Monroe lime or dolomite production. It is the first production from the Monroe, which is of Silurian age, in eastern Michigan. In the Redding pool in Clare County a well starting at 120 bbls. per hour, and in the Freeman pool a well rated at 2,000 bbls. per day, were completed. Both were permitted to flow only a short time.

NEW MEXICO—Work was resumed at a deep wildcat in southern Roosevelt County in Section 27-7s-35, with Ordovician pay at between 7,000-8,000 feet as the goal. One of two large producers completed in the Jal district, Lea County, flowed at the rate of 105 bbls. of oil an hour, with the other flowing 526 bbls. in three hours. Three large producers were completed in the Vacuum field.

Completions in All Fields

(Week Ending February 4, 1939)

	Oil	Gas	Dry	Total	1939 total comp. to date	1938 total comp. to date
N. Y., Pa., and W. Va.	40	10	4	54	332	594
Ohio	5	14	5	24	108	116
Indiana	0	0	0	0	10	12
Kentucky	1	0	4	5	60	73
Illinois	42	6	1	49	386	58
Michigan	8	0	5	13	93	74
Kansas	16	0	6	22	109	218
Oklahoma	12	1	12	25	169	199
Texas:						
North Central Texas	15	0	14	29	195	253
West Texas	36	0	1	37	190	265
Texas Panhandle	7	1	2	10	42	90
East Texas	21	0	0	21	107	278
East Central Texas	1	0	2	3	27	51
East Texas Border	3	0	1	4	11	17
Gulf Coast Texas	21	3	2	26	136	127
Southwest Texas	35	1	12	48	221	213
Total Texas	139	5	34	178	929	1,294
North Louisiana	2	3	2	7	48	69
Gulf Coast Louisiana	9	2	10	21	77	64
Total Louisiana	11	5	12	28	125	133
Arkansas	2	0	2	4	34	24
Montana	3	0	1	4	15	6
Wyoming	2	0	0	2	8	18
Colorado	0	0	0	0	1	0
New Mexico	8	0	2	10	70	65
Utah	0	0	0	0	0	0
California	10	0	4	14	92	165
Total United States	299	41	92	432	2,541	3,049
Total previous week	318	24	92	434		
Week ending Feb. 5, 1938	384	36	81	501		

Outstanding Fields--Highlights

(Week Ending February 4, 1939)

FIELD—	Rigs up	Wells drlg.	Weekly oil completions	Initial prod.	Total No. oil wells	Daily av. prod.
TEXAS						
K.M.A.	31	48	3	2,620	917	25,700
Wasson-Bennett	5	32	3	5,653	206	12,200
Ector County	5	59	14	13,832	1,544	51,298
Winkler County	3	14	2	1,171	1,758	41,043
Howard-Glasscock	4	16	5	5,928	1,042	18,393
East Texas	17	42	21	1,079	25,957	447,146
OKLAHOMA						
St. Louis	5	32	3	138	775	25,650
Oklahoma	0	5	1	20	1,087	90,925
KANSAS						
Barton County	5	18	2	992	402	10,186
Stafford County	4	20	3	1,090	238	3,139
Rice County	2	12	5	2,238	1,268	26,069
Russell County	5	22	3	1,214	1,190	20,703
NEW MEXICO						
Lea County	10	70	7	1,845	2,023	94,950
LA-ARK-TEX						
Rodessa, La-Ark-Tex	2	4	3	720	1,064	64,105
Cotton Valley, La. (deep)	3	11	2	1,128	113	10,490
Schuler, Ark.	2	4	1	150	166	18,365
Jennings, La.	0	6	4	1,444	138	26,753
MICHIGAN						
Freeman-Redding	3	25	3	580	52	9,862
ILLINOIS						
Central Illinois	45	380	42	8,514	2,381	137,865
CALIFORNIA						
Wilmington	6	10	2	401	598	83,545
KENTUCKY						
Birk City	4	15	0	0	115	4,778

Illinois and Kentucky

By STAFF CORRESPONDENT

New Production Peak Made in Basin; District Is Flooded

SALEM, Ill., Feb. 6.—Much of the Illinois basin was more or less under water during the last week in review. In the inundated regions drilling was slowed down, or stopped altogether, and only 49 wells were completed, of which 42 were oil wells, 6 were dry, and 1 was a shallow gas well.

Marion County led in the number of completed wells and initial production, with 23 new oil wells, the actual first-day production of which was 4,073 bbls. One outpost dry hole was reported but no gas wells. The initial production in some cases represented only a few hours. The same may be said of the Fayette County oil completions, of which there were 16, with a total actual initial production of 3,226 bbls. Two dry holes and a shallow gas well were reported. Two oil wells were completed in Jefferson County, together with two dry holes. The oil wells combined to produce 502 bbls. initially. One completion in Wayne County produced 713 bbls. the first day. The only other completion was in Coles County, and it was dry and abandoned. The past week's crop of wells was less than half as large as the number reported late in the fall of 1938, when the weather was good and operations were at their height.

It was reported in Centralia late in the week that Max Pray and his associates will abandon the Pray and others Devonian (Niagara) lime test near the Sandoval field if the Menhall Corp. test in the same general area fails to find production in the Niagara lime. The wells are about three-quarters of a mile apart.

At the opening of this year, according to production figures recently made public, Pure Oil Co. led all Central Illinois producers with 26,197 bbls. per day from 305 wells. The Texas Co. was second with 19,830 bbls. per day from 273 wells; Magnolia Petroleum Co. was third with 9,832 bbls. from 132 wells, and Carter Oil Co. ranked fourth with 8,555 bbls. per day from 241 wells. Shell produced 5,488 bbls. from 79 wells. The average daily production per well on the basis of the above figures was Pure, 85.9 bbls.; Texas, 72.6 bbls.; Magnolia, 73.7 bbls.; Carter, 35.5 bbls.; Shell, 69.5 bbls.

A total of 2,104 wells were on production at the opening of the new year. They were producing then an average of 116,757 bbls. per day. It is estimated that if all the wells were on full production and wells in the Salem field were "squibbed," the basin fields could produce 250,000 bbls. per day for perhaps three weeks. As it is, many of the wells are on part-time production. Carter Oil Co.'s average of 35.5 bbls. per day per well is away out of line with what Carter wells could do if opened and produced to their limit. Pure Oil Co., with its pipe line direct to its own refining plants, is in a better position to produce what it can than companies that have to find outside customers for their production. Texas Co. and Magnolia Petroleum Co. also have direct access to refineries of their own, or of a subsidiary company.

Weather conditions in the past week were the worst since floods invaded the basin in 1936. Heavily loaded supply trucks in the Salem field were marooned in mud up to their radiators.

Magnolia Petroleum Co. was forced to shut down activity at about half their operations in Salem, pending more favorable weather. Although proceeding more slowly than in past weeks Texas Co. maintained its large scale operations and apparently was the most successful operator in this area, as far as combating weather and mud was concerned.

Following were the wells completed, the initial production representing 24 hours unless otherwise stated:

Wells Completed

In Coles County, Texas Co. No. 1 Tracy, C S half NW SE Section 22-13n-7e, dry and abandoned at 3,222 feet (corrected). Devonian lime was topped at 3,100 feet and there was a showing of oil at 3,105-10 feet and at 3,122-23 feet.

Baker Drilling was reported to have abandoned the location for No. 1 Koester, C SW SE Section 18-8n-6e, in Effingham County, after spudding and setting 10¾-inch casing at 42 feet.

Fayette County

In Fayette County, Oils Inc. No. 4 Blurton, 951 from N and 431 from W lines of NW NE Section 32-8n-3e, Weiler sand at 1,419-60 feet, flowed 200 bbls. Same company's No. 5 Blurton, 369 feet from N and 437 from W lines of NW NE Section 32-8n-3e, started at 150 bbls. from Weiler at 1,420-60 feet. Carter Oil Co. No. 3 H. Durbin, SW SE SW Section 4-7n-3e, shot with 30 quarts in Stray sand at 1,568-84 feet, swabbed 440 bbls. Carter No. 1 J. Ramsey, NW NW SE Section 5-7n-3e, Bethel sand at 1,563-73 feet, shot with 20 quarts, flowed 120 bbls. in eight hours, estimated as a 360-bbl. well. Carter No. 7-B N. M. Hopper, SW NW NW Section 8-7n-3e, Stray sand at 1,480-89 feet and Bethel at 1,500-15 feet, shot with 20 quarts, pumped 168 bbls. Carter No. 1 L. Mills, NE NW NE Section 7-7n-3e, Bethel at 1,501-18 feet, shot with 20 quarts, swabbed 432 bbls. Carter No. 4 N. M. Hopper, SW SE SE Section 6-7n-3e, Bethel at 1,492-1,514 feet, shot with 40 quarts flowed 276 bbls. and 85,000 feet of gas. Texas Co. No. 1 Kepner, SE NW SW Section 31-7n-3e, Weiler at 1,546-60 feet, pumped 125 bbls. Stewart Oil Co. No. 3 Griffith, SW SW SW Section 29-7n-3e, Weiler at 1,561-80 feet, shot with 20 quarts, pumped 400 bbls. Shell Petroleum Corp. No. 5 Fulton, SW SW NE Section 29-7n-3e, Weiler at 1,542-76 feet, swabbed 108 bbls. in 20 hours, pumped 67 bbls. in 22 hours. Jarvis Bros. No. 6 Homan B, SE NW SE Section 29-7n-3e, Weiler at 1,558-82 feet (sand record corrected), pumped 150 bbls. Minerva Oil Co. No. 2 Richardson, SW NW NW Section 21-7n-3e, Stray sand at 1,621-32 feet, dry, abandoned at 1,632 feet. Texas Co. No. 1 Q. Buff, NE SE SW Section 30-7n-3e, Weiler at 1,546-74 feet, shot with 10 quarts, pumped 125 bbls. Carter Oil Co. No. 1 C. Baker, SW NW NW Section 6-7n-3e, Weiler at 1,503-37 feet, shot with 60 quarts, swabbed 344 bbls. The Texas Co. No. 1 E. Maxwell, SW SE SW Section 19-6n-3e, Weiler at 1,619-35 feet, pumped 63 bbls. Sherman and others No. 1 Garver, Weiler at 1,596-1,612 feet, pumped 60 bbls. in 8 hours and later pumped 100 bbls. in 15 hours. It will have an allowable of 30 bbls. per day. Same operators No. 1-B Garver, at a total depth of 71 feet, found a 500,000-cu. ft. gas production which will be used for fuel. Zephyr Drilling Co. No. 1 Garver, SE SW SW Section 19-6n-3e, Weiler at 1,607-14 feet, pumped 25 bbls. with considerable salt water.

Illinois Fields

HIGHLIGHTS OF THE WEEK: High water, which covers much of the productive portion of the Central basin fields, interfered greatly with drilling operations, but did not prevent the field from making a new high record of production, 137,865 bbls. per day, as an average for the week. Weather conditions were the worst since water invaded the basin in 1936.

Daily average production of new pools, 137,865 bbls.; of old pools, 8,245 bbls.; total, 146,110 bbls.

Total field operations, including locations, rigs up and wells drilling, 462.

Marion County

In Marion County, F. W. Firman No. 1 Suggs, Cypress sand at 1,767-88 feet, and Benoist at 1,905-17 feet, both dry, total depth 2,150 feet, dry and abandoned.

Zephyr Drilling Co. No. 1 G. A. Mercer, NW NW SW Section 34-2n-2e, Benoist sand at 1,918 feet contained water; McClosky lime topped at 2,109 feet, total depth 2,134 feet, shot with 20 quarts on bottom, no showing; acidized with 2,000 gallons, pumped 58 bbls. Zephyr Drilling Co. No. 4 Lanksford, SW NE SE Section 33-2n-2e, Bethel at 1,891-1,905 feet, pumped 240 bbls. Texas Co. No. 1 W. Lands, NW NW SW Section 33-2n-2e, Benoist at 1,776-1,830 feet, flowed 118 bbls. in three hours, rated at 826 bbls. in 24 hours. Texas No. 8 T. L. Easley, NW SE NW Section 33-2n-2e, Benoist at 1,792-1,859 feet, flowed 469 bbls. Texas No. 4 Stonecipher, S half SE SW SE Section 32-2n-2e, Benoist at 1,756-1,808 feet, flowed 560 bbls. Texas No. 12 K. Wayman, SW NW NE Section 31-2n-2e, Benoist at 1,686-1,734 feet, flowed 57 bbls. in 3 hours. Texas No. 5 W. M. Stroup, SW cor NW NW NW Section 31-2n-2e, Ste. Genevieve lime topped at 1,989 feet, pay at 2,042-55 feet, casing perforated with 65 shots at 2,043-53 feet, and acidized with 3,000 gallons, flowed 148 bbls. Roberts and Murphy No. 5 Dempsey, sand at 1,729-83 feet, flowed 350 bbls. Texas No. 2 Wooten, NE cor SW NE SW Section 30-2n-2e, McClosky lime at 2,077-99 feet, acidized with 3,000 gallons, flowed 400 bbls. W. C. McBride Inc. No. 5 N. L. Lee, SW cor NE SE Section 29-2n-2e, Bethel top at 1,725 feet, total depth 1,766 feet, swabbed 150 bbls. in eight hours, rated as a 450-bbl. well. W. C. McBride, Inc. No. 4 N. L. Lee, NE NE SE Section 29-2n-2e, Bethel sand at 1,703-08 feet, swabbed 119 bbls. in six hours, rated at 476 bbls. a day. Ohio Oil Co. No. 5 C. E. Loyd, SW SW SE Section 28-2n-2e, Benoist at 1,772-1,809 feet, pumped 152 bbls. Ohio No. 4 C. Loyd, NW SW SE Section 28-2n-2e, Benoist at 1,773-1,818 feet, pumped 150 bbls. Ohio No. 3 Loyd, SW NW SE Section 28-2n-2e, Benoist at 1,781-1,815 feet, pumped 120 bbls. Ohio No. 10 M. Young Heirs, SW NE SE Section 17-2n-2e, Benoist at 1,877-89 feet, pumped 91 bbls. Texas Co. 2 Farthing B, NW SE SE Section 33-2n-2e, Benoist sand at 1,872-1,900 feet, pumped 42 bbls. in three hours, rated at 294 bbls.

In the Salem pool, south end, Texas Co. No. 4 M. Bryant, NE cor NW SW NW Section 9-1n-2e, Benoist at 1,837-74 feet, pumped 210 bbls. Frontier Oil & Gas Co. No. 1 School Tract, NW cor SE Section 8-1n-2e, McClosky lime pays at intervals from 2,014 to 2,044 feet, flowed 120 bbls. in six hours. Texas No. 3 G. Johnson, SE cor SW SE NE Section 7-1n-2e, McClosky lime at 1,969-76 feet, flowed 198 bbls. in three hours, rated at 1,396 bbls. per day. Texas No. 1 C. E. Richardson B, SW SE SE Section 5-1n-2e, Benoist at 1,790-1,827 feet, flowed 40 bbls. in three hours, rated at 280 bbls. Texas No. 12 Kalkbrenner, SE NE SE SW Section 5-1n-2e, McClosky at 1,979-85 feet, flowed 45 bbls. in three hours, rated a 315-bbl. well. Texas No. 10 City of Centralia Land, NW cor. SW SE Section 5-1n-2e, McClosky at 1,946-47 feet, flowed 60 bbls. in three hours, rated a 420-bbl. well. Robert's Bros. No. 6 Pittenger, NE cor. Section 5-1n-2e, Benoist at 1,776-1,810 feet, pumped 176 bbls.

Jefferson County

In Jefferson County, Anderson and others No. 1 Peoples, SW SW NE Section 14-1s-1e, a wildcat, was dry and abandoned at 2,117 feet, Bethel sand at 2,073 feet had water. Magnolia Petroleum Co. No. 1 M. Ruthowski, SE

SE SE Section 21-2s-1e, McClosky lime at 2,253-60 feet, total depth 2,273 feet, swabbed 208 bbls. of 39.6 gravity oil. Magnolia No. 1 Oslager, SW cor. Section 22-2s-1e, McClosky lime at 2,252-57 feet, swabbed and flowed 294 bbls. in 22 hours. Dr. More and others No. 1 Novak, SW NW SE Section 28-2s-1e, deepened from 2,264 feet to 2,293 feet, got a hole full of water and was abandoned. Magnolia Petroleum Co. abandoned the location for No. 1 Severs, SW SE NW Section 22-2s-1e.

In Wayne County, Pure Oil Co. No. 1 Keith and others, C E half NW NW Section 34-1n-7e, Fredonia lime top at 3,090 feet, pay at 3,094-3,101 feet, total depth 3,136 feet, acidized with 5,000 gallons through casing perforations, flowed 713 bbls.

In Clinton County, Iroquois Oil Co. No. 1 Parish, SE cor. NE NE NE Section 24-1n-1w, Benoist sand at 1,365 feet, total depth 1,402 feet, pumped only salt water, temporarily abandoned. Shell Petroleum Corp. has two wells not yet completed that are producing oil and water from Cypress sand.

No. 6-A Criley, NW NE NE Section 2-1n-1w swabbed 57 bbls. of oil and 13 bbls of salt water from Cypress sand at 1,196-1,230 feet and No. 3-A Criley, SW NE NE Section 2-1n-1w, swabbed 97 bbls. of oil and 54 bbls. of salt water from Cypress at 1,193-1,220 feet.

New Wildcats

First reports on new wildcat operations included the following:

In Cumberland County, Jarvis Bros. No. 1 Wilson Estate, NE NW NW Section 21-10n-7e, rigging up rotary.

In Bond County, Kesl and others No. 1 Sotthoff, NE NE NW Section 12-6n-5w, spudded and shut down.

In Clay County, Burnett and others No. 1 Smith, NE NW SE Section 21-5n-5e, building derrick.

In Fayette County, L. V. Garnier No. 1 C. T. Wade, NE NW SE Section 31-5n-4e, spudded and shut down.

In Washington County, Shell Petroleum Corp. No. 1 SE SW SE Section 16-1s-2w, a geophysical hole, core drilling at 1,700 feet.

In White County, Robinson and others No. 1 Cora Springer, NE cor. SW NW Section 18-4s-8e, derrick on ground.

In Randolph County, Dr. Seward No. 1 Henry Rehmer, SE SE NE Section 19-4s-7w, shut down for casing.

Among the Outposts

In Menard County, Arthur Scroggins No. 1 Johnson Bros., C SW SW Section 24-19n-5w, Niagara lime at 1,340 feet, total depth 1,570 feet, reported temporarily abandoned.

In Decatur County, Decatur Oil & Gas Co. No. 1 Cook, a "mystery," NE NW SE Section 21-15n-2e, drilling at approximately 2,000 feet.

In Christian County, Oil Development Corp. No. 1 Post, SE SW NW Section 1-14n-1w, spudded and shut down.

In Shelby County, Independent Producers and Refiners No. 1 Hackenberg, SE SW SW Section 20-12n-2e, shut down at 1,595 feet for orders. Corn and others No. 1 Wabash R. R., C N half N half Section 27-10-5e, total depth 1,640 feet with a hole full of water, fishing for under-reamer. Frank Frederick No. 1 Fluge, C N half NE NW Section 34-10n-5e, total depth 697 feet. Joe Wylward No. 1 E. E. Bickford, NW SW SE Section 7-9n-5e, Weiler sand at 1,810 feet drilling at 1,826 feet with the hole full of water.

In Fayette County, George Parker No. 1 Mary Lange, NW cor. SW SW Section 28-5n-2e, reported dry and abandoned at about 1,906 feet. Mylius and others No. 1 Feezel, SE NE SW Section 8-6n-3e, an old well deepened, had McClosky lime at 1,985 feet and was hauling in casing to test showings, total depth 2,001 feet.

In Marion County, Johnson & Betts No. 1 Johnson, NE NW NE Section 32-1n-1e, Benoist at 1,875 feet, drilling at 1,885 feet. Hawley Oil & Gas Co. No. 1 Copple, SW SW NE Section 28-1n-1e, shut down at 1,960 feet. Gardenshire and others No. 1 R. Speaks, NE cor. SE Section 12-1n-1e, shut down at 2,178 feet, for orders. Ulrich & Pogue No. 1 Zanders, SE cor. NW Section 36-9n-3e, shut down at 266 feet.

In Montgomery County, Southern Oil and Petty No. 1 Sawyer, NE SE NE Section 15-8n-4w, machine on ground.

In Edgar County, Black & Moore (formerly reported as Martin and others) No. 1 Sturgell, C NW NE Section 12-12n-11w, of second principal meridian, set 10-inch casing at 740 feet and drilling below 835 feet.

In Montgomery County, Marhill Oil Co. No. 1 Doyle, SE NE SW Section 29-10n-4w, rigged up and shut down.

In Coles County, R. F. Wheless No. 1 W. W. Michaels, SW SW NW Section 1-11n-7e, total depth 2,173 feet, but plugged back to 1,919 feet, filled 550 feet with fluid in 16 hours, of which 140 feet was oil and 410 feet water. The crew was testing.

In Cumberland County, Doran and others No. 1 Haskett, C W half W half W half Section 15-10-7e, rigging up rotary.

In Clay County, Witcher Development Co. No. 1 Fitch, C N half SE SE Section 3-1n-8e, pay at 3,093-3,105 feet, acidized with 5,000 gallons, flowed and swabbed 370 bbls. of fluid in 72 hours. Shut in awaiting tankage. Richard Duncan No. 1 J. H. Liggett, SE NW SE Section 17-5n-5e, shut down at 2,356 feet. Kingwood Oil Co. and Gulf Oil Corp. No. 1 Davis, NW SE SE Section 26-5n-5e, drilling at 930 feet.

In Jefferson County, V. O. Lewis No. 1 Bates, NE cor. NW NE Section 18-1s-1e, total depth 1,805 feet, will move in rotary when weather permits. Transcontinental Oil Co. No. 1 S. W. Carroll, SE NE SE Section 16-2s-1e, was shut down at 1,563 feet because of high water. McQueen and others No. 1 Sorenson, NE NE NW Section 5-2s-2e, shut down at 1,420 feet. Kingwood Oil Co. No. 1 Frost, NW SW NW Section 27-2s-1e, drilling at 1,735 feet. Heenan & Coe No. 1 Kobezeski, NW cor. Section 27-2s-1e, shut down at 2,175 feet. Midfield Oil Co. No. 1 Ervin, SW cor. SE SE Section 24-2s-1e, Roseclaire at 2,215-25 feet, total depth 2,333 feet, plugged back to 2,227 feet and set 5½-inch casing at 2,206 feet. Pyramid Petroleum No. 1 Trout, SW SE SE Section 19-2s-2e, drilling at 1,665 feet.

In St. Clair County, Badger Oil Co. No. 1 Reichert, NE cor. NW NE Section 3-1s-10w, Trenton lime at 778 feet with a small oil showing, set 3⅝-inch casing at 780 feet and shut down for orders.

In Washington County, Smith and others No. 1 Marquard, SE NW SW Section 33-1s-5w, rigged up machine and shut down. Taylor Drilling Co. No. 1 Werhe, NE SE NW Section 35-2s-3w, set 8-inch casing at 67 feet. Jett & Skidmore No. 1 Hoelscher, SW NE SE Section 25-2s-5w, shut down at 1,125 feet for orders. J. L. Henderson No. 1 Kornegger, NE NE NW Section 8-3s-1w, running 6-inch to set at 1,180 feet, total depth.

In Wayne County, Carl Robinson No. 1 Felix, SW SE SE NW Section 15-3s-14w of second principal meridtotal depth 3,409 feet. New Penn Development Co. No. 1 Wagner, NW SW NE Section 30-2s-9e, total depth 3,441 feet, tested at 3,306-13 feet the well swabbed 65 bbls. of fluid 40 per cent water. The crew was still testing.

In Wayne County, Dr. More No. 1 More, SE NE NW Section 16-3s-5e, was coring at 3,330 feet about 50 feet in the Fredonia lime.

In Monroe County, Michael and others No. 1 Faust, C NE NE Section 32-3s-10w, spudded and shut down.

In Wabash County, Longhorn No. 1 E. B. Helm, SE SE NW Section 15-3s-14w of second principal meridian, drilling at 2,280 feet.

In Jefferson County, Palacine Oil Co. No. 1 Inland Steel Co., C SE NE Section 29-4s-2e, drilling at 1,238 feet.

In Perry County, H. B. Warren No. 1 Winkle Estate, SW SW SW Section 19-4s-3w, spudded and shut down.

In Hamilton County, Helmerich & Payne No. 1 Hamilton Land Bank, fishing for drill pipe, total depth 3,312 feet.

In Randolph County, Chlorins and others No. 1 Anderson, NW NE NW Section 12-4s-6w, shut down at 1,340 feet, Salem lime was topped at 1,265 feet. Badger Oil Co. No. 1 Schroeder, SW cor. NW NW Section 27-6s-6w, Trenton lime top at 2,260 feet, total depth 3,300 feet, will shoot.

In Perry County, G. H. Blankenship No. 1 Rheinecker, NW NW NE Section 3-6s-4w, moving in standard tools.

In Jackson County, Ben Banner No. 1 Dean, NE NE SE Section 33-7s-3w, shut down at 1,210 feet.

In Gallatin County, Bailey & Lucas No. 1 Dr. Logan,

(Continued on Page 91)

Fred Phillips Has Good Well in Eastern Muhlenberg Area

OWENSBORO, Ky., Feb. 6.—The Ohio River presented a 32-foot, 9-inch stage here on Friday or 8 feet 3 inches below the flood stage, but the Green River, which flows into the Ohio, was encroaching upon the Spottsville pool in Henderson County toward the weekend. Water was under the boiler in Ralston & Sales No. 1 Annie Stewart and about 3 feet below the top of the casing in the well. Tools which had been lost were said to have been sidetracked in the well, and drilling was continued. All work had been halted on the Palmer Drilling Co. No. 1 Letcher, which is ready to be drilled in. It has been capped and the operators are awaiting the action of the rivers, both of which are near it.

The Conley-Cooksey well, which is away from the river, caved in after the plug had been drilled from it Thursday, and it was necessary to bail mud before the oil production could be determined, it was said. Oil was found at 3,200 feet in No. 1 Casey of the Magnolia Petroleum Co., but the well is to be continued to the Devonian formation at a depth of 3,900 to 4,000 feet.

Fred Phillips, youngest of the nationally known Phillips brothers of Bartlesville and Tulsa, Okla., had the best well of the week, a 280-bbl. pumper in the Belton district in eastern Muhlenberg County. Following are the results of the past week during which one oil well and four dry holes were completed.

Breckinridge County, Glen Dean district: Charles Marsh and others No. 1 Mrs. Delia Moorman, drilling at 400 feet.

Butler County, South Hill district: W. C. Ellison No. 2 Moore & Pendley, dry hole, total depth 142 feet.

Daviess County: Birk City district: Jess Ashby and others No. 1 R. M. Hagan, drilling at 700 feet. Oklahoma district: H. M. Hunt and others No. 2 W. S. Howard, dry hole, total depth 588 feet.

Henderson County, Niagara district: 9-3-6 Oil Co. No. 3 N. R. Duncan, dry hole through Niagara lime. Scuffeltown district: W. H. Parks and others No. 1 Oscar G. Letcher, drilled 7 feet of McClosky lime saturation, total depth 2,105 feet, shut down.

Muhlenburg County, Belton district: Fred Phillips No. 1 Clarence Boggess, pumped 280 bbls. in 24 hours from McClosky lime, total depth 1,542½ feet; No. 1 B. H. Boggess, moving in.

Ohio County, Adaburg district: Nollem Oil & Gas Co. No. 13 Vincent Crow, dry hole through Jett sand. Friendship Church district: Barney Calvert No. 3 John McCarty, moving in. Charles Marsh No. 6 J. C. Nabors, moving in. Fordsville district: W. E. Neal No. 2 Felix Royal, dry hole, total depth 592 feet. Oklahoma district: H. M. Hunt and others No. 1 Shermon Howard, drilling 450 feet.

EASTERN KENTUCKY

ASHLAND, Ky., Feb. 6.—Drilling operations hit a new low in the eastern Kentucky area last week with a majority of the districts reporting no change or no operations. Several new locations were made by Kentucky-West Virginia Gas Co. No completions were reported.

Kentucky-West Virginia Gas Co. has locations made for No. 579 on the Sherwood Osborne land on Little Doty Branch in Knott County; No. 580 on the H. H. Smith farm on Caney Fork, also in Knott County; No. 5250 on the William Crider land on Johns Creek in Floyd County and No. 5251 on the C. W. Preece land on Coldwater Fork in Martin County.

The Inland Gas Corp. is moving in to start No. 206 on the Zada Hutcherson farm on the Right Fork of Troublesome Creek in Knott County and made a location for No. 207 on the Curtis Pigman land, also on the Right Fork of Troublesome Creek.

The Rough River Corp. is still trying to drill around tools in No. 4 on the H. B. Adams, Sr., land at Rock Lick in the Burning Fork district of Magoffin County. The tools have been in the hole several weeks and efforts to drill around have met with little success.

In the South Fork district of Powell County, Boyd, Knox & Brown are down 500 feet in No. 4 on the I. T. Rogers land at Rogers Chapel.

Eastern Field Report

By STAFF CORRESPONDENT

Important Oriskany Test in Beaver County, Pa., Is Dry

PITTSBURGH, Pa., Feb. 6. — In Beaver County, Pennsylvania, the Oriskany test of Hanley & Bird of Bradford, on the S. Calvin farm in South Beaver Township, proved a failure with salt water found 6 feet in the sand. The Oriskany was topped at 4,856 feet, with a showing of salt water at 4,862 feet and about five bailers an hour at 4,864 feet, at which depth it will be plugged.

It is about one-half mile south of the Oriskany gasser on the S. Calvin farm and is about 36 feet lower on structure. Compared to the discovery well in this pool on the William Graham (C. Calvin farm), the new test reached the Oriskany at subsea 3,658 feet, compared to 3,635 feet, or 23 feet lower. The Oriskany gas in the discovery well has since been drowned out by water but it is a gas well from an upper formation. There are still four wells producing from the Oriskany sand in this gas pool, with no new developments announced.

Twenty-three operations were reported in the lower eastern fields during the past week of which three were dry holes, 14 gas wells, and six producers with a daily initial of 124 bbls. most of which was due to a fair well in West Virginia. There were two fair gassers in Ohio.

SOUTHEAST OHIO

In Cuyahoga County, Ohio, in Highland Heights village, Lot 33, Benedum & Trees completed a test on the L. C. Curry farm in the Newburg sand at 2,855 feet and it produced 20 bbls. and 1,000,000 cu. ft. of gas the first day after shot. In the same section on the Grant J. Straight farm, these operators completed a second test in the Newburg at 2,846 feet and it gauged 2,000,000 cu. ft. a day along with 5 bbls. of oil the first day after shot.

In Coshocton County, Kuntz-Hulse, Inc., and others completed a second test on the Howard Wilt farm in Section 6, Perry Township, in the Berea sand, and it is a gas well gauging 45,000 cu. ft. a day with no oil showing. The Berea sand was at 911-919½ feet.

In Licking County, Midland Oil Co. completed a second test on the Burge Orr farm in the southeast quarter of Section 3, Bowling Green Township, in the Clinton sand at a total depth of 3,035 feet. It has a gauge of 275,000 cu. ft. a day with a very small showing of oil. One mile north of Newark City in Newark Township, Ira Hazlett completed a test on the George P. Macklin farm at 2,636 feet, the Clinton sand, and it is good for 250,000 cu. ft. a day.

In the shallow sands of Licking County, F. H. Ward and others completed a second test on the John A. Hughes farm in the Berea sand at 780 feet and it produced 8 bbls. the first day after shot. In Section 9, same township, Liston W. Patten and others completed a second test on the P. O. and Daisy Wright farm in the Berea at 780 feet and it is showing for a 4-bbl. pumper.

In Muskingum County, W. T. Forsyth drilled a test on the Mrs. Alvira Sprague farm in the southeast quarter of Section 8, Monroe Township, in the Berea sand to 964 feet. It produced 5 bbls. the first day and was not shot. This test may be preliminary to a five-spot water flooding program and the sand is being analyzed.

In Noble County, Tri State Oil & Gas Co. completed a test on the Abbot Wagner farm in the southwest quarter of Section 14, Jackson Township, in the Berea grit at 1,745 feet. It is a gas well gauging 90,000 cu. ft. a day.

In Perry County, Marshall & Marshall completed No. 33 on the Donahue heirs tract in the northwest quarter of Section 34, Monroe Township, in the Berea sand at 1,134 feet. It produced 2 bbls. the first day after shot.

In Washington County, John T. Hall and others completed No. 3 on the Peter Fulmer farm on Jackson Run, Section 12, Grand View Township, in the second Cow Run sand at 1,300 feet, and it is a gas well gauging 265,000 cu. ft. a day. It was a former first Cow Run gas well deepened. There was no showing of oil.

SOUTHWEST PENNSYLVANIA

No new production was added in Southwest Pennsylvania during the week. In Beaver County, the test of B. C. Laughlin on the A. M. Covert farm in Green Township was drilled through the Berea sand and it was dry. In Hanover Township, G. B. Dawson is drilling a test on the Thomas Mansfield farm and has reached 850 feet.

In Allegheny County, J. S. Wally is drilling a test on the Wilson Shaw farm and has reached 1,500 feet. It is in Shaler Township. In North Fayette Township, Young Brothers are down 1,350 feet in a test on the James Sturgeon farm and had to pull the 6⅝-inch casing to underream.

In Greene County, Carnegie Natural Gas Co. shut down on top of the Nineveh Thirty-Foot sand in the J. H. Orndoff farm, Center Township, to cement the break above that formation. In Morris Township, McVay and others topped the Big Injun sand at 2,136 feet with a gas show at 2,148 feet and are drilling at 2,156 feet in the test on the Elmas Loughman farm.

In Washington Township, Greene County, Equitable Gas Co. is deepening No. 1 T. J. Ross at 2,657 feet and No. 1 Yeager at 3,175 feet, with the Fifth sand at 3,130-42 feet.

In Monongahela Township, Greene County, the Mo-

(Continued on Page 103)

Prolific Pool Being Developed 15 Miles From Drake Well

OIL CITY, Pa., Feb. 6.—About 15 miles northeast of the site of the Drake well, drilled more than 79 years ago, and only about 5 miles northeast of where King, Ferris & Co. opened the Tidioute field in June, 1860. A new pool is being developed in Eldred Township in western Warren County, Pennsylvania. Why it was not discovered in any one of the 78 years between the opening of the Tidioute field and the discovery of this new petroleum deposit close by is a mystery.

The new pool is only 2 miles northeast of Grand Valley, and produces from depths ranging from 550 to 700 feet, depending on the surface elevation. The wells start off on the pump at from 18 to 30 bbls. of oil per day.

Walter R. Redmond, of the producing firm of Redmond & York, tells the story of this interesting pool as follows:

New developments about 2 miles northeast of Grand Valley, Warren County, may be indicative of an extensive fourth sand oil pool in that locality.

For the past two years oil developments by J. M. York and W. R. Redmond on the E. E. Reynolds farm, Eldred Township, gave indications of a possible fourth Venango sand pool. After deciding upon the probable production trend, a drilling program which "staggered" the wells across the trend gave gave indication that the main body of the pool had been located by the No. 6 Reynolds.

As a result of the showing made by this well, considerable activity is in progress in the area. About 1,000 acres adjacent to the Reynolds farm have been leased by parties from Tidioute, Warren, Olean, Clarendon, Titusville, and Bradford. The Redmond & York holdings incorporate 200 acres through which the pool appears to extend.

25 Bbls. in 20 Hours

Six weeks after No. 6 Reynolds was put into production, on a test pumping, the well produced 25 bbls. in 20 hours. While the highest observed gas pressure to date has been 55 pounds, indications are that the well will put up about 100 pounds pressure, inasmuch as fluid rose to better than 300 feet in the hole after the shot. To date, Well No. 6 has failed to show the presence of salt water. Wells drilled prior to No. 6 have shown at most a few gallons per pumping.

Recent developments by A. V. Clinger, of Tidioute, and A. W. Goal, of Clarendon, on the Payden property have resulted in two wells drilled to the fourth sand producing approximately 18 and 25 bbls. per first pumping. The sand varies from 8 to 14 feet in thickness as drilled to date.

In a total of nine wells drilled, this fourth sand has been reached at a depth ranging from 550 to 700 feet, depending upon the elevation of the well. In each of the wells drilled, the first Venango sand has been found ranging in thickness from 20 to 35 feet of pay. The first Venango, which shows well while being drilled, lacks rock pressure to produce on a par with the fourth Venango.

Peculiar Formation

Glacial debris covers the valley floor adjacent to the above-mentioned developments to a depth from 150 to 300 feet. Undoubtedly the first Venango is exposed in the glacial drift along the valley floor. This factor is likely responsible for the general lack of rock pressure in the first Venango in the neighborhood of Grand Valley. Increase of rock pressure is likely to be encountered in the first Venango as one proceeds farther northwest or southeast from the valley.

One conspicuous structural formation which was encountered in the drilling of the above wells was a "crevice" through which water left the hole in each case as the proper depth for the crevice was reached. Undoubtedly this crevice was the Pennsylvanian-Mississippian unconformity. Water left the holes of the various wells at depths ranging from 50 to 200 feet, depending again upon the elevation of the well in question.

After taking into account the estimated rise of the productive trends, some indication was noted of a structural high. Too much value can easily be placed upon surface indications since nonconformable subsurface beds alter the coincidence of surface and subsurface structural axes. However, observance of drainage trends, coupled with record of wells of the area which were drilled in the past, would suggest a structural high north or northwest of current developments.

Southwest Texas District

By F. L. SINGLETON

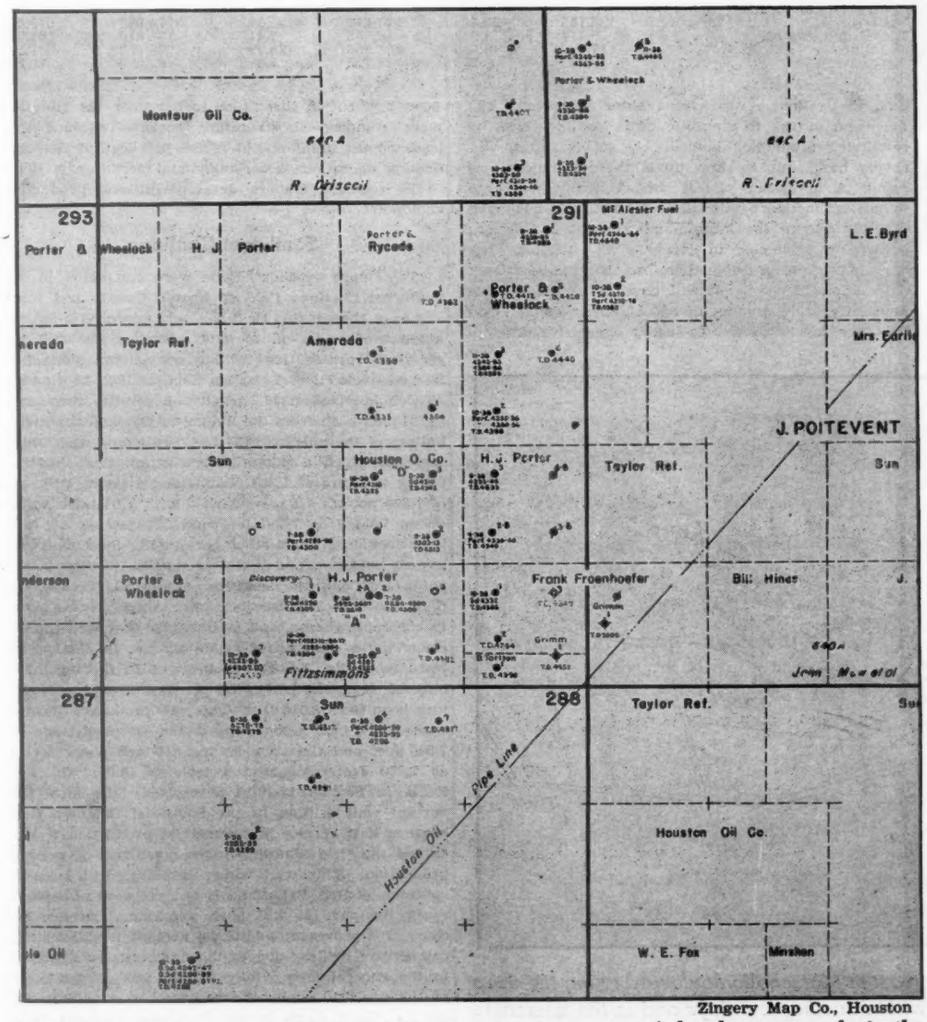
East White Point Extension; Oil From Riverside Gas Field

CORPUS CHRISTI, Tex., Feb. 6.—News of interest in the Southwest Texas district the past week included a 9,000-foot extension to the East White Point field, San Patricio County; the opening of the first oil production at Riverside, Nueces County, and the discovery of two small pools in the Laredo and Balcones Fault Line districts.

J. B. Cage and others No. 1 Dunn, on the extreme east side of the old White Point gas field, was cleaning out at the close of the week through an eighth-inch choke, flowing an estimated 4 bbls. of fluid per hour of which 90 per cent was oil and the remainder wash water. Tubing pressure was 400 pounds and shut-in casing pressure 385 pounds. The well is producing from sand at 5,671-75 feet, total depth. There is little doubt that the completion of this well joins the two fields, in view of the completion of Houston Oil Co. No. 2 Baldwin. This test is midway between the Cage producer and the East White Point field proper. Oil sand was logged at 5,655-66 feet and the well was completed through perforated casing at 5,653-59 feet. On a 14-hour gauge, flowing through an eighth-inch choke, it produced 84 bbls. Tubing pressure was 900 pounds and casing pressure 1,045 pounds.

In the East Plymouth gas field, San Patricio County, Republic Natural Gas Co. acquired a farmout on Humble Oil & Refining Co., B. G. Henry and Smith & Tolbert lease and will rework two abandoned tests. Both of these leases were drilled in 1938 and gas production was developed on the Smith & Tolbert lease at a plugged-back depth of 4,881 feet. The hole is being cleaned out and a series of production tests will be made.

The Riverside gas field, Nueces County, was converted into an oil field as Seaboard Oil Co. No. 2 Wilson was turned into the tanks, and in four hours flowed 50 bbls. of 33-gravity oil through an eighth-inch choke. Tubing pressure was 1,100 pounds and casing pressure 2,100 pounds. The well produced gas when tested at 4,994-97½ feet and final completion was made by reperforating the casing at 4,995-98 feet. Interest in this area is now centered on Republic Natural Gas Co. No. 1 Seaboard, approximately 1½ miles southeast of the above test which is preparing to make a drill-stem test. The hole is bottomed at 5,015 feet with sand showing oil and gas logged at intervals from 4,982-5,007 feet.



Zingery Map Co., Houston

Plat of the Fitzsimmons field, Duval County, showing scope of development early in the new year

La Rosa Extended

In the La Rosa field, Refugio County, Phillips Petroleum Co. No. 1 Paveleck extended production 3,000 feet north as it was completed for an initial production of 206 bbls. in 20 hours flowing through a three-sixteenths inch choke under a casing pressure of 1,200 pounds and tubing pressure 725 pounds. The hole is bottomed at 6,525 feet and the well is producing through perforated casing at 6,313-27 feet.

Two wildcats located along the Frio-Vicksburg trend in Jim Wells County were holding attention. H. H. Howell No. 1 Wright, 10 miles north of Alice, was shut down at a total depth of 6,800 feet after an electrical survey of the hole had been made. This well is reported to have tried to blow out after approximately 10 feet of soft sand was cored at 6,550 feet. Side wall cores showed sand with an oil and gas odor, and casing may be cemented for a production test. In the Los Precenos grant, about 3 miles from production at South Alice, W. H. Mathews and others No. 1 Clark tested 450 pounds of working pressure and recovered 1 "quarter" of 51-gravity oil on a drill-stem test at 5,141-58 feet. This test is also shut down waiting orders.

In the same county and in the East Alice area, Henshaw Brothers No. 1 Thigpen, perforated casing at 5,351-54 feet and tested an estimated 90 bbls. of fluid per day of which 60 per cent was oil and the balance wash water. Tubing pressure was 625 pounds and casing pressure 700 pounds. This well has been watched with much interest in view of the fact that it is located in an area which has produced only gas.

A new wildcat was announced for the county as F. A. Gillespie & Sons staked location for No. 1 Mary T. Shear, about 7 miles southeast of Alice, in Block 44, Adam, Beatty and Moulton Survey. The well will be drilled to a depth of 6,500 feet. It is on a farmout lease from the Shell Petroleum Corp. Several major companies own protection around the well.

In Duval County, Hiawatha Oil & Gas Co. No. 22 Parr has apparently extended Cockfield production in the Benavides field, about 3,500 feet southeast as a drill-stem test at 5,493-98 feet tested 260 feet of oil and 270 pounds of pressure. Casing was cemented on bottom at 5,498 feet. To the south and in the Longhorn field, the same company extended production several hundred feet with the completion of No. 7 Miller. On a 24-hour gauge, flowing through a 5/32-inch choke, it made 110 bbls. Casing was perforated at 4,914-18 feet.

Locations for two more interesting wildcats were made for this particular trend of Duval County. C. G. Glasscock has started drilling No. 1 Nicholas Garcia in the Santa Cruz de Concepcion grant, while in the same grant, Hamill & Smith spudded No. 1 G. S. Perez. The two tests are in the southeastern part of the county, in an area which has been worked extensively with geophysical instruments.

In Goliad County, and in the Weser gas area, Mar-Tex Oil Co. staked location for No. 1-A W. F. Albrecht in the Thomas Hancock Survey, about 1,900 feet east of Steinberger Petroleum Co. No. 1 Albrecht, a recently completed gas well.

R. P. Holland and others No. 1 Gayle, Section 59, B.S.&F. Survey, Live Oak County, is reported to have pumped at the rate of 11 bbls. per hour from the Government Wells sand at 1,390-97 feet, the total depth.

In Starr County, D. D. Oil Co. No. 1 Dallas Joint Stock Land Bank, 2 miles north of the Ricon field, will probably be abandoned as a result of a drill-stem

(Continued on Page 104)

California Field Report

By
L. P. STOCKMAN

Reduced Field Work Helps in Effort to Curtail Output

LOS ANGELES, Calif., Feb. 6.—The reduction in drilling by major companies and most of the larger independent operators is becoming more evident weekly. The past week was no exception and from all evidence at hand no material change will be made in this program of restricted development for another several months at least. Wildcat exploration will, however, continue unabated as it took operators several years to get over the last wildcat exploration moratorium. The new curtailment program which has been in effect since December 15 has resulted in a considerable restriction of crude oil production but the question still exists as to whether it is sufficient to stabilize conditions on the Pacific Coast.

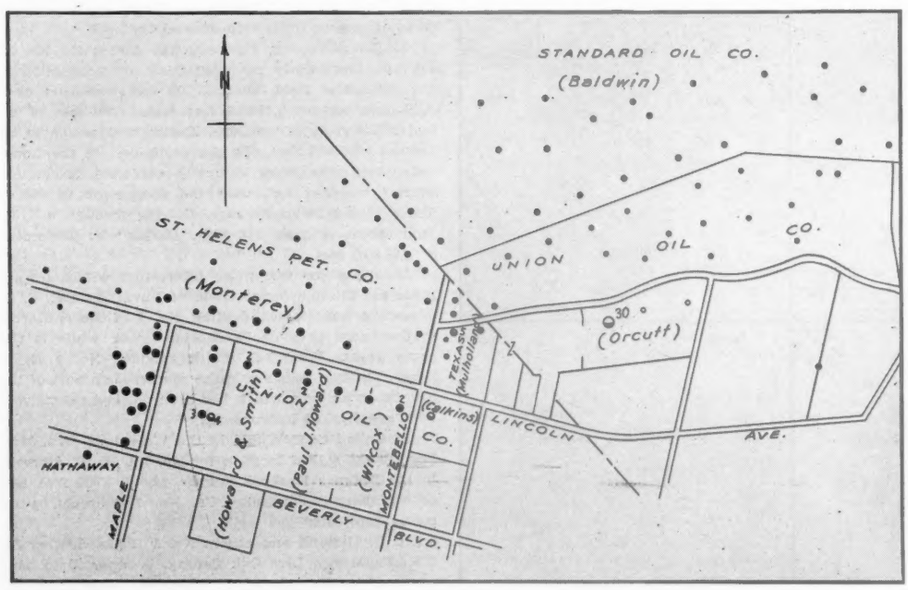
Japanese shipments during 1939 will undoubtedly be much lower than has generally been expected due to slowing up of military activity in China and disturbed condition of business in general in Japan. Any great decline in offshore shipments is bound to exert an important influence on conditions in California especially if crude oil production exceeds the demand and makes it obligatory for marketing companies to continue storing the surplus. The cumulative effect of curtailment over a period of years has resulted in a condition where the state is faced with a substantial potential with no way of relieving the situation. The settled production of the older fields is more than enough to supply current demands including offshore shipments with the result that new fields can not produce at an economical rate. Under the present rate of production, which the Emergency Committee has set at 300 bbls. per day maximum for each well, operators have no way of recovering capital investment except over a period of years and thus flush fields are held back and add to the cumulative total. A large part of the state's potential at the present time represents wells of normal size in older fields or in fields like Kettleman North Dome which have never been allowed to flow to a maximum degree and have been under curtailment restrictions since discovery. The extension of the flowing life of fields like these by restricting production immediately subsequent to discovery has begun to show up in the curtailment program. A few years ago it was relatively simple to reduce production by curtailment but this is now very difficult due to the large number of wells that are capable of producing in excess of the 300 bbls. per day. It is quite probable therefore that the maximum daily allowable per well will have to be reduced below the present amount of 300 bbls. per day. If 300 bbls. per day is too low to justify aggressive development any cut in this figure will render the situation more complex. It therefore becomes evident that lessors must grant operators the privilege of reducing drilling operations accordingly and permit new fields to be retarded from a development and production standpoint.

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	January 28		January 21			
Intercoastal-domestic—	Total this week	Daily average	Total last week	Daily average	This year to-date	Same time last year
Fuel oil	.....	.....	.....	.....	61,980	.....
Diesel and gas oil	.....	.....	72,368	10,338	163,501	.....
Gasoline	.....	.....	129,039	18,434	129,039	263,604
Kerosene	.....	.....	.....	.....	.....	59,885
Lubricants	.....	.....	37,621	5,374	37,621	.....
Foreign exports—						
Crude oil	125,499	17,928	87,980	12,569	550,844	1,535,458
Fuel oil	37,547	5,364	347,583	49,655	780,206	275,873
Diesel and gas oil	25,301	3,614	163,288	23,327	390,372	285,644
Gasoline	.....	.....	124,569	17,796	463,973	402,572
Kerosene	.....	.....	15,259	2,180	90,339	122,026
Coastwise-domestic—						
Crude oil	129,167	18,452	77,180	11,026	658,220	658,761
Fuel oil	251,447	35,921	216,083	30,869	738,591	1,243,564
Diesel and gas oil	70,311	10,044	116,531	16,647	248,811	154,654
Gasoline	227,139	32,448	231,343	33,049	884,049	1,236,290
Kerosene	.....	.....	9,942	1,420	9,942	18,077

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic—						
Diesel and gas oil	.....	.....	.....	.....	.....	178,662
Lubricants	4,170	596	.....	.....	4,170	.....
Foreign exports—						
Crude oil	186,030	26,576	139,553	19,936	325,583	336,219
Fuel oil	98,957	14,137	16,692	2,385	115,649	26,031
Diesel and gas oil	31,459	4,494	3,986	569	35,445	98,893
Gasoline	290,416	41,489	50,507	7,215	340,923	138,473
Kerosene	33,224	4,746	16,003	2,286	49,227	70,669
Lubricants	2,438	348	948	135	3,386	.....
Coastwise-domestic—						
Fuel oil	195,155	27,894	177,611	25,373	774,683	619,690
Diesel and gas oil	29,414	4,202	16,908	2,415	131,810	161,080
Gasoline	117,290	16,756	201,586	28,798	766,452	681,125
Kerosene	18,943	2,706	18,725	2,675	97,036	79,165



No. 1 Calkins of Union Oil Co., the first well east of Montebello Boulevard to log the deep zone of Miocene age, should be on production within another few days and in the meantime No. 30 Orcutt-La Merced of the same company may extend the field further to the east if the pay is found

Southeast Coalinga

Two more excellent wells were completed in the Southeast Coalinga field of Fresno County last week and even though this field has only produced a limited amount of crude oil to date operators are still aggressively prosecuting drilling operations. Petseahon has completed No. 7-18-F in Section 18-20-16 flowing 4,080 bbls. of clean 32.3-gravity oil per day through a 34/64-inch bean from the Avenal or Gatchell zone with bottom of the hole at 8,034 feet. This new well which was not given a potential production test shows a tubing pressure of 1,330 pounds and a casing pressure of 1,390 pounds. It was finished with a 9⅝-inch water string landed at 7,500 feet and 559 feet of 6⅝-inch liner including 537 feet of perforated. Petseahon, the largest holder of potentially productive acreage in the Southeast Coalinga field, has completed derricks for four new wells and has locations staked for two more. In the southwestern end of the field, Standard Oil Co. completed a well on fee-owned acreage in Section 13-20-16 when No. 1-17-F was brought in flowing 2,333 bbls. of clean 33.4-gravity oil per day through a 90/64-inch bean from 8,015 feet. This new producer, finished with a 6⅝-inch liner, topped the Gatchell zone at 7,840 feet and the crew landed a 9-inch water string at 7,820 feet. Amerada Petroleum Corp. No. 7-17 S.P.L. in Section 17-19-16 is probably the most important well drilling in the Southeast Coalinga field because if it results in commercial production it will extend the field almost 2 miles northwest of present production. This well which is being drilled under contract by Bell & Lofland is not yet deep enough to reach the pay. It will bear watching, however, because if it proves up additional acreage it will lead to competitive drilling due to the numerous small leases in the general area. Holly Oil Co. has started preparations to drill on its 40-acre parcel west of Superior Oil Co. No. 1 Cagle in the Southeast Coalinga field, but actual spud of this well to be drilled in Section 12-20-15 may be delayed for another few weeks pend-

ing additional developments. The delay in starting work on this test is due to a gas shortage in the field as a large part of current production of natural gas is being delivered for domestic consumption in the town of Coalinga. In the Coalinga West Side field, W. E. Ramsey is contemplating deepening Magnet Oil Co. No. 2 Fearon in Section 18-20-15 which is at present bottomed in Cretaceous at 4,835 feet. This well topped the Kreyenhagen at 3,124 feet and cored 3 feet of Glauconitic sand at 4,577 feet but failed to find the Gatchell zone.

Torrance—Harbor City

The Eshelman district of the Torrance field of Los Angeles Basin is still holding the spotlight due to recent completions and the probability that several additional wells are scheduled for completion next week. At 240th and Walnut streets, Kovell Oil Co. has uncovered some promising oil sand in No. 1 Deep Test and this has greatly stimulated leasing activity as a completion of this well as a commercial producer would extend productive limits about 2,000 feet to the southwest. Kovell has cored this oil sand in the Del Amo zone and with bottom of the hole at 5,160 feet has landed a string of 7-inch casing at 4,800 feet. A. & T. Oil Co. has established a new drilling record for the Eshelman section of the Torrance field by logging the entire oil zone, drilling to 5,160 feet and setting pipe in a little over seven days. The new wells completed in the Torrance field this week are Huntington Signal Oil Co. No. 1 Clarke finished flowing 404 bbls. of clean 26.4-gravity oil through a 44/64-inch bean from 5,114 feet and Pacific Western Oil Co. No. 13 Marble completed pumping 368 bbls. of relatively clean 26.2-gravity oil per day from 4,939 feet. No. 1 Clarke was finished with 1,750 feet of 5¾-inch liner including 340 feet of 125 mesh landed on bottom. No. 13 Marble was finished with a 7-inch liner including 1,502 feet of 6⅝-inch liner on the bottom and cemented through perforations at 4,754 feet. Immediately upon completion of No. 13 Marble, Pacific Western Oil Co. began rigging up rotary drilling equipment on No. 12 Marble preparatory to deepening it from 3,740 feet to the lower zone around 4,950 feet. The Torrance field is the most active district in the state at the present time and if Kovell Oil Co.'s outpost comes in as a commercial producer we may anticipate the starting of another group of 15 to 20 new wells in the immediate future. Activity in the Harbor City area has declined to such an extent that there are only a few wells under way. This district has failed to yield good flowing wells with the result that drilling operations have dropped to a minimum.

Wilmington

The most important development in the Wilmington field is the starting of work by Signal Oil & Gas Co. in conformity with a contract awarded it by the Long Beach Harbor Commission covering exploitation of the tideland accumulation in the east end of the structure. Preparations have been started by this company to drill eight new wells, which will be bottomed beneath the tideland accumulation by directional drilling. Eighty wells are included in the drilling agreement and so the program of Signal Oil & Gas Co. will extend over a period of several months. The Long Beach Harbor Commission voted to reconsider an action that would have awarded drilling rights to Ramsey Petroleum Co. on four tracts containing 269 acres of tideland property in the Long Beach Harbor section of the Wilmington field. This action was taken as a result of a mass attack by Long Beach operators who had petitioned the commission to cut up the property into smaller parcels so that they could bid on them individually. Ramsey Petroleum Co.'s bid of 60¼ per cent was by far the highest and this company would have been granted the franchise if no petition had been filed to cut up the acreage into smaller parcels.

Union Pacific Railroad Co., largest holder of productive acreage in the Wilmington field and with a minimum of 35,000,000 bbls. of crude oil yet to be recovered, appears to be increasing its scope of work judging by the number of new locations staked but will probably spread out this new work over a period of several weeks. During the current week two new wells were completed in the Wilmington field but neither well showed substantial production. Richfield Oil Corp. completed No. 31 Pacific Dock flowing 252 bbls. of clean 18.2-gravity oil per day from the Ranger zone with bottom of the hole at 3,176 feet. This well which was brought in flowing through a 17/64-inch bean was finished with an 8⅝-inch water string landed at 2,892 feet and 312 feet of 6⅝-inch liner including 291 feet of perforated. Selegna Oil Co. No. 5 Harbor, with bottom at 3,630 feet, has been completed pumping 149 bbls. of 14.8-gravity oil cutting 5 per cent from the Ranger zone after the hole had been redrilled to 2,980 feet. Production of the Wilmington field is still

TOTAL TANKER SHIPMENTS FROM CALIFORNIA TO DOMESTIC AND FOREIGN PORTS

	January 28		January 21			
	Total this week	Daily average	Total last week	Daily average	This year to-date	Same time last year
Intercoastal-domestic—						
Fuel oil	.....	.....	.....	.....	61,980	.....
Diesel and gas oil	.....	.....	72,368	10,338	163,501	178,662
Gasoline	.....	.....	129,039	18,434	129,039	263,604
Kerosene	.....	.....	.....	.....	.....	59,885
Lubricants	4,170	596	37,621	5,374	41,791	.....
Foreign exports—						
Crude oil	311,529	44,504	227,533	32,505	876,427	1,871,677
Fuel oil	136,504	19,501	364,275	52,039	895,855	301,904
Diesel and gas oil	56,760	8,109	167,274	23,896	425,817	384,537
Gasoline	290,416	41,489	175,076	25,011	804,896	541,045
Kerosene	33,224	4,746	31,262	4,466	139,566	192,695
Lubricants	2,438	348	948	135	3,386	.....
Coastwise-domestic—						
Crude oil	129,167	18,452	77,180	11,026	658,220	658,761
Fuel oil	446,602	63,800	393,694	56,242	1,513,274	1,863,254
Diesel and gas oil	99,725	14,246	432,929	61,847	1,650,501	1,917,415
Gasoline	344,429	49,204	133,439	19,063	380,621	315,734
Kerosene	18,943	2,706	28,667	4,095	106,978	97,242

TWO YEARS AGO, a welcome innovation—today, Wyteface Steel Tapes are standard equipment all through the oil industry.

Black-on-white graduations, easy to read, even in poor light . . . a crack-proof surface that protects the steel from rust and corrosion . . . a new resilience that checks kinks or curls, greatly increasing the useful life of the line . . . all these advantages make Wyteface a great convenience in the field and a valuable safeguard against costly errors.

There are Wyteface Steel Tapes in all sizes and types—in cases or on reels—for every job in the oil field; for gauging, strapping, measuring pipe and for general service. Wyteface Tapes are stocked by leading oil well supply companies. Ask your dealer about them—or write us for a complete catalog.

EST. 1867
KEUFFEL & ESSER CO.
NEW YORK • HOBOKEN, N. J.
CHICAGO · ST LOUIS · SAN FRANCISCO · DETROIT · MONTREAL

GOTT WATER COOLER
Made in 3, 5, 8, 10, and 20 gallon sizes.

Gotkoo!
WATER CANS & COOLERS

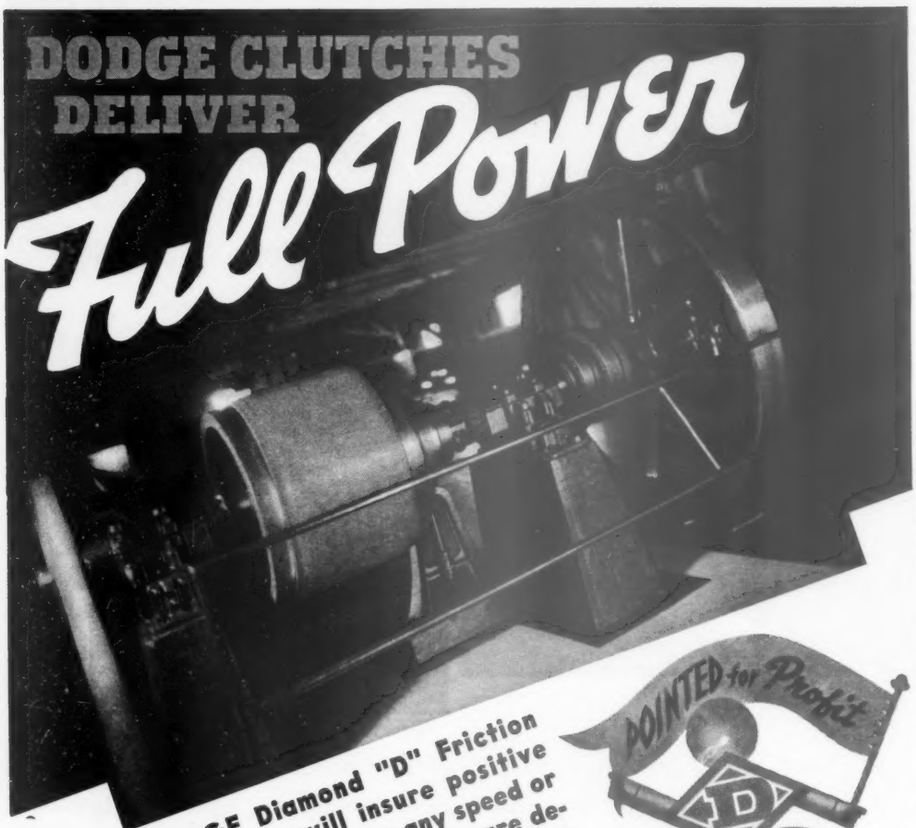
GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug fitting large removable top, handy non-leaking push button faucet. GOTT Water Cans for handy field use. Your Supply Store has them, get one today! . . . . . .

GOTT WATER CAN
Made in 1½, 3, 5, and 10 gallon sizes.

H. P. GOTT MFG. CO.
WINFIELD, KANSAS

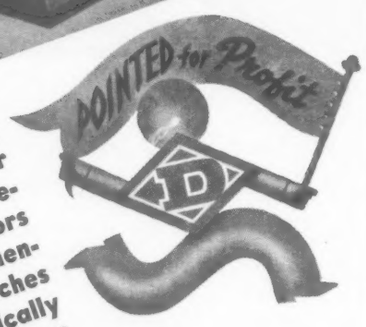
KEEP PURE DRINKING WATER ALWAYS HANDY

DODGE CLUTCHES DELIVER Full Power

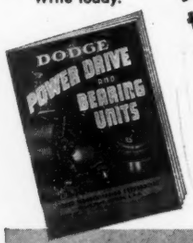


DODGE Diamond "D" Friction Clutches will insure positive power control under any speed or service condition . . . They are designed with ample safety factors to accommodate liberal momentary overload . . . These clutches are dependably and economically adapted to power transmission service as well as for application on various types of machinery used in oil production.

DODGE MANUFACTURING CORPORATION
Mishawaka, Indiana, U. S. A.



Send for your copy of Bulletin A-321 entitled "Power Drive and Bearing Units". Write today.



Let Dodge assist you in selecting "The Right Drive for Every Job".

DODGE
MISHAWAKA

THE Right Drive FOR EVERY JOB

running substantially above the umpire's allowable although all operators are conforming to the 300 bbls. per day maximum set for wells by the Executive Emergency Committee on Curtailment. If all other fields get into line it would appear quite likely that the Curtailment Committee can secure further concessions on the part of Wilmington operators which will reduce the overage.

Montebello

Union Oil Co. is expected to extend the productive limits of the deep zone in the west end of the Montebello field within a few days as it has landed a water string in No. 1 Calkins at 6,334 feet and has bottom of the hole in the seventh zone with bottom at 7,160 feet. A series of production tests indicate that this well, located in the eastern end of the western extension, should result in a substantial completion. It is the present intention to limit production to the lower part of the sixth zone although the upper part of the seventh may be tested out. It has not been definitely determined whether the bit is in the seventh zone or not as the usually accepted marker was not found in this well. Union's No. 30 La Merced, located east of No. 1 Calkins and well within the older section of the Montebello field, found the fifth zone wet on a formation test at 5,685 feet and drilling operations were resumed. This well is of prime importance because if the sixth or seventh zone proves productive it will greatly enhance future production of the Montebello field. The bit in No. 30 La Merced is at present nearing the 6,000-foot level and should reach the depth at which the upper member of the sixth zone should be found within another 250 feet. During the current week, Union Oil Co. completed No. 4 Howard & Smith flowing 962 bbls. of very clean 37.2-gravity oil per day through a 44/64-inch bean from the fourth finger of the sixth zone with bottom of the hole at 6,680 feet. This new well was finished with an 8⅝-inch water string landed at 6,337 feet and 418 feet of 6⅝-inch liner including 55 feet of perforated landed on bottom and cemented through perforations at 6,624 feet.

Kettleman Hills

Kettleman North Dome Association completed a big well in the North Dome of Kettleman Hills this week when No. 36-22-Q in Section 22-22-18 was brought in flowing 4,143 bbls. of clean 38.2-gravity oil and 5,160,000 cu. ft. of gas per day from the Temblor with bottom of the hole at 7,460 feet. This new well, which has an elevation of 739 feet, was brought in flowing through a 1¾-inch bean and showed a tubing pressure of 350 pounds and a casing pressure of 750 pounds. The hole was finished with an 8⅝-inch water string landed at 6,894 feet and 590 feet of 6⅝-inch liner carrying perforations at 6,905-7,089 feet and was cemented through perforations at 7,089 feet. Top of the McLure shale was logged at 5,263 feet and top of the Temblor at 6,605 feet. This well is in the eastern end of the field on the Ochsner permit which was acquired by General Petroleum Corp. and turned into the general pool for unit operation by Kettleman North Dome Association. Out in the west end of the North Dome, Standard Oil Co. has plugged back well No. 46-13-H in Section 13-21-16 from 11,030 feet to 10,684 feet and on a formation test this outpost showed a recovery of 1,925 feet of gassy mud with the tester open for one hour at 9,665-10,036 feet. This well, which is bottomed in the Avenal zone, does not appear to have sufficient kick to result in a natural flow. The recovery has been mud and gas up to the present. In Section 24-21-16, due south of the well, Kenda is making hole in well No. 54-24-H in Section 24-21-16 at 9,500 feet but still has some distance to go before reaching the top of the Avenal horizon. Both Standard Oil Co. and Kenda are making preparations for additional drilling, especially in the eastern end of the structure. During the early life of the field, development work by both of these operators was centered in the Huffman and Felix areas due to drilling operations by operators developing fee acreage.

Rosecrans

Drilling operations in the Rosecrans field tapered off this week but will probably show an early increase as Hydrocarbon Products, Royalty Service Corp. and Universal Consolidated Oil Co. contemplate the starting of additional work. During the current week, Universal Consolidated Oil Co. completed No. 14 Trust flowing 335 bbls. of 32.4-gravity oil cutting 2 per cent

(Continued on Page 94)

Texas and Louisiana Gulf

By
NEIL WILLIAMS

Deep Discovery in Ace Pool Is on Sparta-Wilcox Trend

HOUSTON, Tex., Feb. 6.—Development of the Sparta-Wilcox trend continues to hold the attention of Gulf Coast operators as a result of a new deep sand discovery in the Ace field, Polk County, where Peyton Brothers No. 3-B Kirby Lumber Co. recovered several hundred feet of pipe line oil. The drill-stem test was attempted at 7,735-55 feet, the total depth, but the seat of the testing tool slipped to 7,745 feet, and was open 10 minutes, recovering 450 feet of oil and 60 pounds of pressure. Bottom-hole flowing pressure was 1,200 pounds and shut-in pressure was 2,800 pounds. The hole will be cored deeper before casing is cemented for final completion.

The Ace field was discovered in 1933 by Dick Schwab with the completion of No. 2 Kirby Lumber Co. which produced distillate from the upper Cockfield sand at a total depth of 4,856 feet. While oil production was later established in 1936, additional development was unsuccessful and the field has been classified as a third-rate structure. The new producer is a west offset to the same operator's No. 1-B Kirby Lumber Co., a small Cockfield sand producer, drilled on a farmout lease from the Shell Petroleum Corp.

While the sand section in the deep test has not been definitely identified, it is generally believed to be the Sparta sand which was found productive in the past year in the Segno field, several miles northeast, in the same county, and at Cleveland, Liberty County. Both of these fields originally produced from the Cockfield formation. The Sparta sand is a member of the Wilcox series that was opened at Joe's Lake (Spurger) Tyler County, and this type of production has been extended eastward into coastal Louisiana with such discoveries as Villa Platte, Cheneyville, Tepetate and Eola.

Location for a south offset to the new producer at Ace was made by Shell Petroleum Corp. for No. 1 F. C. Doucette in the P. A. Sublett Survey, and it is reported that location for a deep test will be made in the Livingston field within the next few weeks.

In the League City field, Galveston County, preparations were being made by Phillips Petroleum Co. to test No. 1 Dr. Patton, an outpost test, northeast of production. This test is the deepest well drilled, and is bottomed at 10,535 feet with 5½-inch casing cemented at 10,412 feet, preparatory to testing a new sand logged by an electrical survey at 10,115-25 feet and 10,130-80 feet. Should the well fail to produce from this horizon, the hole will be plugged back and another test made at approximately 9,000 feet.

In the Garwood area, Colorado County, Coyle & Concord No. 4-B Powell flowed 30 bbls. of fluid on a 14-hour test of which 95 per cent was oil and the balance wash water and mud. The well is flowing through a 3/32-inch choke under a tubing pressure of 1,000 pounds and casing pressure 1,900 pounds. Gravity of the oil tested 40 degrees. The hole was drilled to a depth of 6,158 feet and production was obtained by perforating casing at 5,923-26 feet. In the Bernardo area, E. D. Corbit Survey, Mills Bennett No. 1 Truchard topped the Cockfield formation at 4,429 feet and is coring shale below 4,519 feet. The well is scheduled to be drilled to the Wilcox sand.

Sun Oil Co. No. 1-A Lutcher Moore, which opened production on the Echo prospect, Orange County, is flowing into the burning pits at an estimated rate of 100 bbls. of fluid per day through a quarter-inch choke. A shake-out test showed from 22 to 85 per cent salt water, and from 15 to 78 per cent oil. Tubing pressure is 750 pounds.

Humble Oil & Refining Co. No. 3-C West fee, southeast side of the Clear Lake field, Harris County, is being recompleted after it flowed salt water and oil on a one-hour drill-stem test through perforated casing at 5,933-35 feet. Sand was topped at 5,899 feet and cored to 5,927 feet.

In the Goodykoontz area, northeast of the Fairbanks field, Harris County, Kirby Petroleum Co. is rigging up No. 1 Daniels in the S. S. Reynolds Survey, about 1 mile northeast of Union Production Co. No. 1 Goodykoontz, the discovery well. The well is being drilled on a farmout lease from Humble Oil & Refining Co.

On the southeast flank of the Esperson dome, Liberty County, General Crude Oil Co. staked location for No. 1 Pearl Burges, Angus McNeil Survey. The location is approximately 1 mile east of the same company's No. 1-B Esperson which opened production from a deep sand last week. On a potential test, the well flowed 501 bbls. through a quarter-inch choke from perforated casing at 7,305-35 feet.

Magnolia Petroleum Co. No. 7-A West, West Ranch field, Jackson County, extended production 1,300 feet west when it flowed 165 bbls. daily through an eighth-inch choke. Oil sand was topped at 5,087 feet, and cored to a depth of 5,113 feet. In the Francitas field, Jackson County, Mills Bennett Production Co. staked location for No. 1 Lawrence, center of Lot 36 of the Schwind & Mahers second subdivision in the John D. Newell Survey.

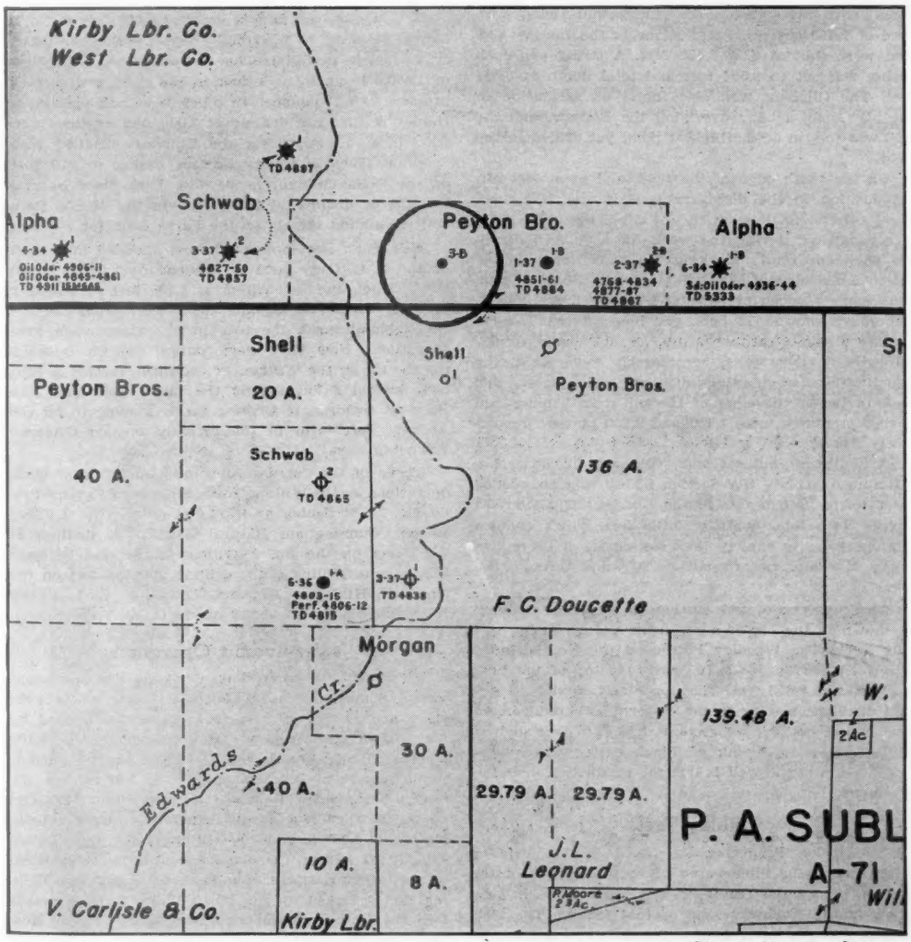
Louisiana Coast

Along the Louisiana Coast, Pure Oil Co. opened a new sand in the Sweet Lake field, Cameron Parish, with the completion of No. 1 Stanolind Oil & Gas Co. This well flowed dry gas last week at 7,112-28 feet, and the casing was reperforated at 7,137-42 feet. On an initial gauge the well flowed 350 bbls. of 35.6-gravity oil through a 14/64-inch choke.

In the West Lake Verret field, St. Martin Parish, Shell Petroleum Corp. was completing No. 2 Jeanerette as the second producer in the field. A drill-stem test in oil sand topped at 8,046 feet and bottomed at 8,057 feet tested 12 stands of 37-gravity oil. Seven-inch casing was cemented at 8,040 feet.

Humble Oil & Refining Co. staked location for another deep test on the Potash dome, Plaquemines Parish, where last week the company opened production from a deep sand. The new test, No. 38 Orleans Levee Board, is located 500 feet north, 75 degrees east of Well No. 37 in Section 13-18s-15e.

(Continued on Page 102)



Zingery Map Co., Houston

Plat of the Ace field showing location of Peyton Brothers No. 3-B Kirby Lumber Co. which has opened production from a new sand in the Wilcox series

North Louisiana, Arkansas

By GEORGE WEBER

South Arkansas Deep Tests Reaching Interesting Stages

SHREVEPORT, La., Feb. 6.—Oil indications in two South Arkansas deep wildcats were the principal objects of interest in the tri-state district during the past week. With field activity on the decline, wildcatting is receiving increased interest. Two fields continue in the spotlight, however, with new developments in production extensions. These pools, Cotton Valley and Shreveport, showed added discoveries of importance in the past week.

Estimated Production

Estimated daily gross production of all companies for the week ending February 4 follows:

NORTH LOUISIANA

	Barrels
Bellevue	660
Caddo light	4,000
Caddo heavy	2,640
Converse	515
Cotton Valley heavy	100
Cotton Valley light	*10,490
Cross Lake	2,500
De Soto and Red River	1,165
Elm Grove	245
Haynesville	2,850
Holly	75
Homer	2,650
Lisbon	6,540
Pleasant Hill	105
Rodessa	27,900
Sarepta-Carterville	†450
Sligo	820
Sugar Creek	255
Urania	2,625
Zwolle	2,800
Total	69,385

SOUTH ARKANSAS

Buckner	1,435
Champagnolle	1,845
El Dorado	1,710
Lisbon	250
Magnolia	2,425
Miller County	340
Nevada	615
Rodessa	5,155
Schuler	18,365
Smackover light	1,930
Smackover heavy	15,250
Stephens	510
Troy	970
Urbana	1,100
Village	460
Total	52,360

Texas side of Rodessa field, 31,050 bbls. daily.
*4,125 bbls. is distillate. †150 bbls. is distillate.

Arkansas Wildcats

The Shell Petroleum Corp. and Ohio Oil Co. No. 1 Warren, a wildcat in the Stamps area of Lafayette County, C SE SE Section 13-16-24, revived interest. The deep wildcat previously found porosity in the top of the Smackover lime, which showed oil saturation, but failed to make a commercial producer in that formation due to low permeability.

After testing the Smackover section and swabbing salt water, the No. 1 Warren was deepened. A section of soft oolitic lime was cored at 7,220-7,318 feet, and cores below 7,288 feet showed a salty taste. Tight porous oolitic lime was cored to 7,337 feet. The hole was carried to 7,418 feet and shut down, awaiting orders. The Smackover lime section may be acidized, and further tests of the saturated zone made.

In the same county Wadley-Erwin and others No. 1 G. W. Taylor, C NE SW Section 15-19-26, is coring below 6,100 feet, after topping the Gloyd section of the lower Glen Rose at 5,985 feet. The Gloyd, one of the principal producing zones in Rodessa, failed to show oil in this wildcat, which is about 10 miles northeast of the Miller County section of the Rodessa field.

Ouachita Test

In Ouachita County the Stephens area was closely watched last week, as a deep test cored the Smackover lime. The Deep Rock Oil Corp. No. 1 C. Wesson, SE cor. NE Section 23-15-19, cored the top of the Cotton Valley at 4,305 feet, the Buckner at 5,700 feet the anhydrite at 5,800 feet, and drilled into the top of the lime at 5,923 feet. Porosity was topped at 5,934 feet and the test was drilled to 6,003 feet and shut down awaiting a Schlumberger survey. Saturation was reported in the upper part of the lime zone, although porosity was poor. The lower, more porous section section showed salt water.

Schuler

Field drilling in the Schuler field has declined considerably in recent weeks, with only six rotaries active. Phillips Petroleum Co. No. 1 Amanda, a west edge test, cored the Jones sand and Reynolds lime and set casing preparatory to bringing in a producer early this week.

Cotton Valley

Two completions in the Bodcaw sand, one an oil well and the other making colored distillate, revealed further information on the oil zone in the lower Marine horizon at Cotton Valley, in Louisiana this week. The oil well, Oliphant Oil Corp. No. 1 Gray & Stephens, C SE SW Section 35-21-10, came in gauging 35 bbls. hourly of 45-gravity oil through a 16/64-inch choke, with tubing pressure of 1,825 pounds and casing pressure of 2,040 pounds. Perforations in the Bodcaw section were shot at 8,397-8,420 feet. A string of 7-inch casing was set to 8,594 feet and total depth is 8,597 feet. The Oliphant well also found oil saturation in the "D" sand, a body overlying the Bodcaw, and the "D" was topped at the highest point yet drilled in the field.

On the south edge of the field, and in a west offset position to the discovery well in the "D" sand, Hunt Oil Co. No. 1 Sandifer, C NE NE Section 4-20-10, was completed during the week for a colored distillate well, apparently marking the transition area between crude oil and gas-distillate in the Bodcaw sand. The casing was perforated at 8,660-68 feet, and an initial gauge showed 12 bbls. per hour of the 57-to-60-gravity distillate through a quarter-inch choke. A gas-oil ratio of 4,000 to 1, considerably lower than the usual ratio in regular gas distillate wells, shows this well to be on the edge of the oil zone. Tubing and casing pressures were 1,450 and 2,200 pounds, respectively.

A southwest outpost well, Oliphant Oil Corp. No. 2-B Stewart, C NW NW Section 4-20-10, was abandoned after testing salt water in the Bodcaw. The test was carried to a total depth of 9,198 feet, which enabled the operators to explore the possibilities of the entire lower Marine series from the "A" sand through the Davis.

The presence of two sections in the Bodcaw sand is shown in the log of a southeast Cotton Valley test this week. The Woodley Petroleum Co. No. 1 Couch, C NW SW Section 36-21-10, cored the top of the Bodcaw sand at 8,543 feet. The upper section showed gas and distillate, similar to the majority of producers in the section, but a lower section at 8,583-97 feet showed oil saturation. A string of 7-inch casing was set at 8,583 feet and the well is due for completion over the week-end.

Sibley Test

The Union Producing Co. No. 1 Walker Unit, a deep test in the Sibley area of southeastern Webster Parish, topped the Travis Peak this week, and had no show in the Holloway sand of that section. The test, directed to the lower Marine formation, is drilling in shale and sand below 7,100 feet.

In the Shongaloo field of northern Webster Parish the Magnolia Petroleum Co. is below 9,100 feet with no shows since heavy oil showed in the Davis sand last week at 8,450 feet.

Pine Island

In the Pine Island sector of Caddo Parish, a drillstem test in the L. H. Mahon No. 1 Henderson showed a five-minute flow of oil at 2,465-80 feet, and casing will be set to attempt a completion. The test is located near the Colonial Corp. No. 1 Thigpen & Herold, which also showed oil several weeks ago in the same section, although several feet higher than in the Mahon well. Additional drilling is expected shortly to explore the possibilities for extension of the producing sand.

New York-Penna. Gas Fields

COUDERSPORT, Pa., Feb. 6.—The one completion in the Oriskany sand gas fields of northern Pennsylvania and southern New York in the past week was the wildcat of Van Gelder and others on the Fred Farnham farm in Addison Township, Steuben County, New York, which was abandoned at 3,986 feet after drilling through the Oriskany. A show of salt water was encountered in the sand drilled through from 3,937 to 3,977 feet. The Onondaga was found at 3,915 feet.

G. L. Cabot, Inc. is shut down at 3,937 feet in No. 2 George Hotaling in Woodhull Township, Steuben County, 20 feet in the sand. This test uncovered a gas flow of 1,500,000 cu. ft. at 1 foot in the sand with a rock pressure of 625 pounds. In other Woodhull operations Hanley & Bird are drilling at 3,056 feet on the G. H. Rice farm after passing the Tully at 2,941-93 feet; Sylvania Corp. is setting surface casing to 910 feet on the Della Calhoun farm; New York State Natural Gas Co. is drilling at 2,036 feet on the Meade farm and is building the rig on the Parks farm for No. 3.

New Penn Development Co. has spudded in its test on the E. G. Cady farm in Troupsburg Township and G. L. Cabot, Inc., is drilling at 2,799 feet on the Ray Scribner farm and is shut down on location on the L. Highland farm, the two current Greenwood area operations. New York State Natural Gas Co. is building the rig on the William Preece farm, Hanley & Bird have staked a location on the Lloyd Hall farm and Belmont Quadrangle Drilling Co. is moving in on the Andrew Taft farm in the recently opened Cameron Township area.

Three of the current Allegany County, New York, operations are in Willing Township where Empire Producing Co. is fishing at 4,750 feet on the No. 2 Floyd Wilson, Cunningham Natural Gas Co. is drilling at 3,595 feet on the No. 2 William Shear and Belmont Quadrangle Drilling Co. is drilling at 2,952 feet on the No. 3 F. Hilligass. In Alma Township, G. L. Cabot, Inc., is drilling at 2,560 feet on the C. W. Vossler farm.

Pennsylvania Operations

The bulk of Pennsylvania Oriskany gas operations are in Sharon Township, Potter County, where nine wells are drilling to test the possibilities opened by No. 1 Wolcott. Allegany Gas Co. is drilling at 3,133 feet on the Dickerson farm, deepest of the current tests; New Penn Development Co., at 330 feet on the Gorton-Kemp farm; Empire Producing Co., at 718 feet on the F. Dickerson farm; Belmont Quadrangle Drilling Co., at 1,750 feet on the N. Kemp farm; G. L. Cabot, Inc., at 615 feet on the Plank School farm. In addition to the tests already drilling Belmont Quadrangle Drilling Co. is rigged up for No. 2 Wolcott and Sylvania Corp. is rigged up on the Elmer Kemp farm. New Penn Development Corp. is building rig on the Dunshie farm and G. L. Cabot, Inc., is moving in on the Reva Kemp farm.

(Continued on Page 102)

ANOTHER GUMBO BUSTER LEADER

The FC-200 UNIT DRAW WORKS

Cat shaft and foot pedals quickly removed bringing unit within 8' width to meet highway regulations.

Extended skid base, for one or two engines, eliminates cost of rig substructure.

Built-in reversing mechanism and transmission operates in oil tight case—reduces assembly time, eliminates cost of conventional reverse clutch.

Simplicity of control an outstanding and exclusive feature—any one of four speeds can be imparted to the Drum, Rotary Table and Cathead by this one lever, without varying the speed of the engines.

Entirely new, triple compound brake design with tremendous leverage assures positive load control—an added safety factor for equipment and crew.

The FC-200 is a small compact and comparatively inexpensive drilling unit, designed especially for use in shallow and medium depth drilling localities, where low costs, portability, ease of installation, drilling speed and operating flexibility are important factors.

With four forward speeds and one reverse, a maximum capacity of 200 h. p., and so designed that either one or two internal combustion engines serve as the prime mover, it has the stamina, flexibility, responsiveness, versatility and operating conveniences of larger, more expensive drilling and hoisting units, as well as the simplicity and cost saving features of small, portable drilling units.

Just the thing for Illinois Basin and similar depth work. Get specifications and prices, with your choice of power, from your Bridgeport representative.

BRIDGEPORT

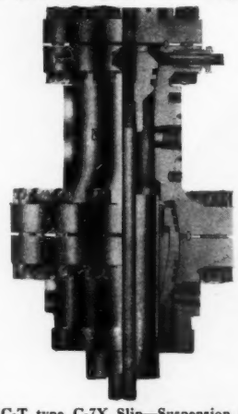
THE BRIDGEPORT MACHINE CO. Factory and General Offices, Wichita, Kan.

HOUSTON	DALLAS	SAN ANTONIO	CORPUS CHRISTI	ODESSA	FORT WORTH
L. D. 203 Local "Cap" 1301	L. D. 548 Local 2-4282	L. D. 219 Local "Gar" 5671	L. D. 31 Local 574	L. D. 683 Local 684	Local and L. D. 3-3506

SHREVEPORT	CENTRALIA, ILL.	TULSA	OKLAHOMA CITY	BARTLESVILLE	WICHITA	AND BRANCH STORES
L. D. 15 Local 6481	Local and L. D. 589	L. D. 681 Local 5-3204	L. D. 785 Local 7-2725	Local and L. D. 3410	L. D. 59 and 116 Local 2-1431 and 2-1432	

O-C-T *SLIP–SUSPENSION* **CASING HEAD** permits drilling, running and cementing casing and hanging casing at any desired point through oversize flanged blowout preventer equipment. Last joint of casing is cut off above hanger and welded thereto as shown below . . . no special length joint of casing is required. T-16 Tubing Head flanged above Casing Head, as shown below, permits drilling in and running and landing tubing through blowout preventer equipment. Lock down screws force hanger into sealing position before removal of preventers.

Full particulars gladly sent on request.



O-C-T type C-7X Slip—Suspension Casing Head with O-C-T type T-16 Tubing Head flanged above.

OIL CENTER TOOL CO.

O-C-T

HOUSTON, TEXAS, U.S.A.

Sold Through Supply Stores

"PRE-SOLD"

Wall MANILA

OIL FIELD CORDAGE stands the gaff!

Complete stocks are carried in both mid-continent and gulf coast fields.

Wall Rope Works, *Inc.*
2000 Nance Street,
Houston, Texas
Telephone: Cap. 0244

CONTROLLED VERTICAL DRILLING

TOTCO

DRIFT RECORDER

ACCURATE • DEPENDABLE

FAST • SAFE • ECONOMICAL

Measuring the inclination of a well at frequent intervals, results in accurate information from which to formulate drilling technique and methods. TOTCO gives dependable information under *all* conditions.

ELECTRICAL OIL TOOL CORPORATION, LTD.
1311 N. Havenhurst Dr., Los Angeles

TOTCO RENTALS AND SERVICE
Carson Machine and Supply Co.
Houston Oil Field Material Co.
R. D. Wallace, Casper, Wyoming

EXPORT: Lucey Export Corporation

Among the Drilling

ALLEN & MORRIS extended the La Rosa field, Refugio County, Texas, approximately 3,000 feet with completion of Phillips Petroleum Co. No. 1 Pavelock. Three rotaries are operating in the field for Coronado Corp. on the Rooke and Spaulding leases, while in the Luby field two operations are reported for Seaboard Oil Co. In the active McCampbell field Aransas and San Patricio counties, J. P. Nash No. 1 Young & Henderson is being completed in the 7,100-foot sand.

CRON & GRACEY are moving a large rotary to the Weser gas area, in Goliad County, Texas, for Mar-Tex Oil Co., where No. 1-A Albrecht will be drilled to a depth of approximately 5,500 feet. The well is located 1,980 feet east of a recently completed gas well, in the Thomas Hancock Survey.

GLENN H. McCARTHY is attempting to open a new sand in the League City field, Galveston County, Texas, for Phillips Petroleum Co. as No. 1 Doctor Patton, an outpost test, was being tested. The hole is bottomed at 10,535 feet and 5½-inch casing was cemented at 10,412 feet. Possible sands were logged by an electrical survey at 10,115-25 feet and at 10,130-80 feet.

AL BUCHANAN opened a new field in Jim Wells County, Texas, for Shell Petroleum Corp. The well is located on the Von Blucher lease, near the town of La Gloria in the southern part of the county.

HUCKLEBERRY & CLINE, Wichita Falls, Tex., have two Diesel rigs and one steam rig in the K.M.A. field, Texas, which they are keeping busy drilling two wells for Staley Oil Co. and one well for Huckleberry, Staley, and Cline partnership account. Wells are being drilled on the Anna Margold property.

HELMERICH & PAYNE, INC., Tulsa, has completed No. 1 Roberts, in Section 3-8-4e, Pottawatomie County, Oklahoma, which flowed 200 bbls. of oil in 24 hours. It is an old test deepened from 4,061 to 4,090 feet. The Hunton lime was topped at 4,060 feet. In Seminole County, Oklahoma, their No. 3 Willis in NW SW SE Section 7-7n-4e, was drilling at 593 feet, and had set 65 feet of 10-inch casing.

KING DRILLING CO. and FOREST DEVELOPMENT CO. are drilling No. 1 T. C. Anderson and others, Taylor County, Texas, wildcat test approximately 3 miles south of Abilene; it is drilling below 3,505 feet in lime. Operators have passed up a good showing in the Canyon lime, drill-stem test at 3,340 feet having recovered 106 feet of fluid, half oil and half mud, with good show of gas. Test had been cored from 3,339 feet to 3,361 feet, recovering lime with good show of oil in the Canyon series.

RICHMOND DRILLING CO. took two cores which failed to show either oil or gas at No. 1 Bryant-Link, Section 7, Block A-48, P.S.L. Survey, Andrews County, Texas, which is a wildcat. They have been drilling ahead below 4,515 feet, in lime. First core was from 4,430 feet to 4,448 feet, and second from 4,448 feet to 4,466 feet. The first recovered lime and the second lime, anhydrite and sandy shale.

JONES & SHELBURNE No. 2 Kuhnle, SW SE NW Section 4-15-12w, in the Greenvale pool of Russell County, Kansas, was acidized in the Kansas City-Lansing lime at 3,071 feet and got a potential of 1,205 bbls. a day.

TAUBERT & McKEE DRILLING CO., Fort Worth, Tex., spudded two new tests during the past week, one in Jack County and one in Jones County, both in West Central Texas. The Jack County test, for Rowan & Nichols of Fort Worth, is in the Sarah J. Bailey farm of the J. Bailey Survey, 660 feet east of a producer in the same tract and west of the Bryson townsite. In western Jones County, the test is for Ralph R. Carrol, Fort Worth operator, and is in the G. Herndon lands of the Goliad County School Lands Survey, 6 miles southwest of the Chiddenden pool.

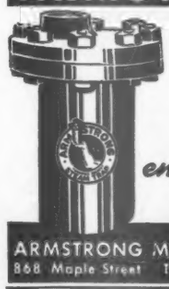
MOORE EXPLORATION CO., drilling firm for Moore Brothers, of Midland, Tex., has started a drilling program in western Tom Green County and northeastern Irion County. Its first test has been spudded on Continental Oil Co. V. P. Tippett lease in Irion and will be drilled approximately 1,000 feet to test the Permian lime. It will be followed, it is understood, by additional shallow core tests. Location of the first operation is in the R. Rodriguez Survey 1803, on lands now owned by H. R. (Jake) Wardlaw, Jr. Moore Exploration Co. is reported to be receiving a donation of one-half of the lease rights owned by Continental

STANCLIFF PATENTED *Ribbed* SCREEN

HAS LARGE INLET AREA AND LARGE PRODUCTION CAPACITY

HOWARD SMITH CO.
1201 SAWYER STREET
Houston, Texas.

ARMSTRONG



STEAM TRAPS *make drilling engines work better!*

ARMSTRONG MACHINE WORKS
868 Maple Street Three Rivers, Michigan

Standco NO-SMOKE

STANDCO BRAKE LINING

Drillers all prefer STANDCO BRAKE LINING because it makes an easy brake, "feeds off" evenly, and wears and wears and wears. See page 2100, Composite Catalog.

STANDARD BRAKE LINING CO.

Contractors

BREWSTER'S

New Roller Bearing

SIX-IN-LINE BLOCK

. . . . designed to give your traveling block a center-poise straight fall, and enough strength built in to give it a capacity of more than 400 tons. The manganese steel sheaves are fitted with ample sized roller bearings individually Alemite lubricated. A one-piece safety guard covers the sheaves. Write for prices on this new block and the companion traveling block.

The BREWSTER CO., Inc.

Phone 2-3181 Shreveport, La.

New Iberia - Houma - Lake Charles
Rodessa

For Your DRILL PIPE'S SAKE

USE

KINZBACH-AJAX SLIPS!

● They reduce rotary slip costs since, by changing inserts, several pipe sizes can be handled with one set of segments. They assure even distribution of load over entire gripping surface as each insert is individually anchored to slip segment. These and many other advantages are described in descriptive literature, gladly sent upon request.

Available Through Leading Supply Stores

KINZBACH TOOL CO., INC.

HOUSTON, TEXAS

on the lands formerly owned by V. P. Tippett, for the drilling of the first hole as an oil test to the Permian horizon. John I. Moore and P. D. Moore of Moore Exploration Co. are formerly of San Angelo, Tex. They have oil production in the Snyder and Harding fields in Howard County and in the McDowell pool in Glasscock County.

ARROW DRILLING CO., Odessa, Tex., has staked a new test for the east side of the Foster pool in Ector County, West Texas. The company located its No. 8 Foster, 330 feet from the north line and 719 feet east of No. 7 Foster, in Section 8, Block 42, T.&P. Survey.

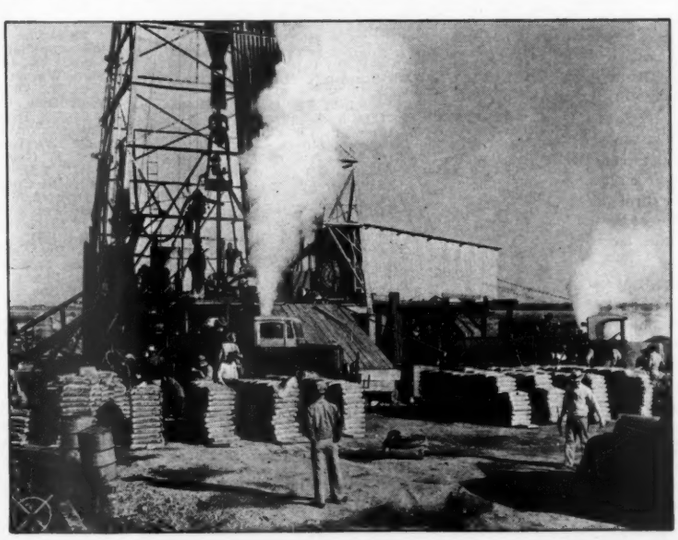
OSAGE DRILLING CO. is preparing to drill a quarter-mile west outpost on the southwest side of the Denver area in Yoakum County, West Texas, following the acquisition of the northeast quarter of Section 898, D. Gibson Survey. The well will be No. 1 Mrs. Ned O. Moller, staked 660 feet out of the northeast corner of Section 898. It will be a quarter of a mile west of Gulf No. 1 Moore, in Section 897. The drilling company and others acquired the west 80 acres of the quarter from Mrs. Miller and the east quarter from G. P. Lake, of Tyler. Texas Co. holds acreage in the section.

J. W. WALSH, drilling contractor, of Odessa, Tex., has started two new tests for Gulf Oil Corp. on its large Goldsmith lease in the Goldsmith pool of Ector County, West Texas. The contractor is drilling No. 153 Goldsmith and recently received contract for No. 162 Goldsmith. The drilling well is in Section 6, Block 42, T.&P. Survey, while the new location is in Section 15, Block 44, of the T.&P. Survey.

GARDNER BROTHERS DRILLING CO., Dallas, Tex., is drilling one well and has received contract for another from Gulf Oil Corp. on its Goldsmith lease in the Goldsmith pool, Ector County, West Texas. The company is drilling No. 152 Goldsmith and is preparing to start No. 161. Both tests are in Section 9, Block 44, of the T.&P. Survey.

GOLDING & COCHRAN, Dallas, Tex., have staked two new locations seeking a quarter-mile east extension on the northwest side of the K.M.A. pool of Wichita and Archer counties, North Texas. They staked No. 6 D. R. Preston, on a 57-acre lease in the SE quarter Section 27, Block 7, H.& T.C. Survey, and No. 7 Preston in the southwest corner of the same tract.

OKAN DRILLING CO., Wichita, Kans., has a rotary derrick for No. 1 Ashman, in NW NW Section 29-23-3w, a semiwildcat at the northwest edge of the Burrton townsite, which is not far from production in the Burrton pool, Harvey County, Kansas.



Glenn H. McCarthy large rotary rig, as 1,200 sacks of cement were used in cementing 10,412 feet of 5½-inch casing in Phillips Petroleum Co. No. 1 Dr. Patton, an outpost test in the League City field, Galveston County, Texas

USE THIS NEW BAASH-ROSS WIRE LINE WIPER

when pulling wireline core barrels, bailing and swabbing

Pack-off assembly automatically latches in body when tools are lowered into well — automatically releases when tools are withdrawn.

•

Confines *All* fluid to flow line.

•

Long service packing

•

Non-sparking

•

Send For New Bulletin

BAASH-ROSS

TOOL COMPANY

5512 Boyle Ave. • LOS ANGELES

5300 Clinton Rd. • HOUSTON

Export Office: 30 Rockefeller Plaza
New York City

H. C. SMITH ROCK BITS

INSURE INCREASED SPEED AND ECONOMY

H. C. SMITH ROCK BIT
available in sizes 5⅝" up to and including 13"

•

Send for Folder or see Composite Catalog

H C Smith Oil Tool Co.

GENERAL OFFICES AND PLANT
P. O. Box 431, Compton, Calif.

Illinois Service:
BROWN-WALTERS CO.,
Centralia, Illinois

Rocky Mountain Area

By T. R. INGRAM

Adams-Felmont Lance Creek Test Bettered by Deepening

DENVER, Colo., Feb. 6.—The Adams Oil & Gas Co. and Felmont Corp.'s important test in Lance Creek, Wyoming, was deepened 10 feet and showed an increase in production in the Leo sand. The Osage field in Weston County has two small completions and two new operations.

Montana reported three average wells in Kevin-Sunburst. The Nadeau Brothers test in north Cut Bank failed to respond to shooting and was plugged and abandoned. Two new refineries are to be constructed this spring at Cut Bank and Shelby.

There were no new operations in Colorado or Wyoming.

NEW MEXICO

Resumption of work at a deep wildcat in southern Roosevelt County featured the news from southeastern New Mexico fields the past week. It was the Shell Petroleum Corp. No. 1 Harwood, C S half SE SE Section 27-7s-35e, which has been shut down for several weeks. Originally drilled to total depth of 5,151 feet, it was plugged back to 4,290 feet, where it was reported to have swabbed 16 bbls. of sulfur water an hour. Work was resumed the past week and operators were last reported drilling in a new hole below 5,400 feet. It was expected to be deepened to around 8,000 feet, or to Ordovician formation. Location of the wildcat is in a district generally referred to as the "Three County Corner" area, including adjacent parts of Chaves, Lea and Roosevelt counties. A large regional high runs through the area, and it has been thoroughly geologized and surveyed by geophysical crews.

Repollo Oil Co. No. 1 State, Lease 182, SW Section 31-16-37, third oil producer in the Lovington area and three-fourths mile east of the pool, was acidized with 2,500 gallons and flowed 432 bbls. of oil in 22 hours, with 200,000 cu. ft. of gas, through three-fourths inch choke on tubing set at 4,694 feet. It died, tubing was raised to 4,639 feet and in the first 9½ hours it flowed 260 bbls. of oil, settling to 72 bbls. in the next 8½ hours, when it died again. It then was shut in for nine hours and when reopened flowed 84 bbls. of oil in 10 hours. Lime pay was found at 4,604-43 feet, total depth 4,760 feet.

Southeast New Mexico completions of the past week included three producers in the Vacuum field and two big producers in the Jal-Langlie field, Lea County. Seven of 10 wells completed were in Lea County, three in Eddy County.

Phillips Petroleum Co. and Pure Oil Co. No. 4 Woolworth, C NW SE Section 33-24-37, Jal district, topped pay at 3,445 feet, was bottomed at 3,491 feet in sandy lime and flowed 180 bbls. of oil in three hours through tubing set at 3,473 feet. It previously had flowed 526 bbls. of oil in four hours while drilling, and later flowed 274 bbls. of oil in 35 minutes.

Montecito Oil Corp. No. 1 Woolworth, NE SE SW Section 33-24-37, topped pay at 3,425 feet, total depth 3,555 feet in lime and sand, and flowed 105 bbls. of oil in one hour, naturally. Two-inch tubing was set at 3,445 feet.

Culbertson & Irwin No. 2 Henry, SW SE SW Section 26-25-37, southeast edge of Langlie, was completed at total depth of 3,295 feet in lime and sand, flowing 158 bbls. of oil in 24 hours from pay topped at 3,240 feet. It was shot with 150 quarts at 3,253-95 feet.

In the Vacuum field, Ohio Oil Co. completed No. 4 State-McCallister, C NW SW Section 25-17-34, at 4,710 feet, total depth. Three pay zones were found, at 4,420 feet, 4,465 feet and 4,680 feet. The well flowed 522 bbls. of oil in 22 hours, with 500,000 cu. ft. of gas.

Shell Petroleum Corp. No. 2-V State, C SE SE Section 27-17-35, flowed 318 bbls. of 38-gravity oil naturally in 12 hours. Top of pay was found at 4,495 feet, total depth 4,680 feet.

Phillips Petroleum Co. No. 18 Santa Fe, C NW NE Section 34-17-35, topped pay at 4,200 feet, total depth 4,550 feet, and flowed 149 bbls. of oil in 11 hours. After acidizing with 1,000 gallons, it flowed 375 bbls. of oil in 12 hours.

Twin Oil Corp. No. 1-C State-Christmas, C SE NE Section 17-22-37, Penrose district, had pay at 3,630 feet, total depth 3,699 feet, was acidized with 2,000 gallons and flowed 67 bbls. of oil in 24 hours.

In Eddy County, Worth Drilling Co. No. 1 Taylor, C SW SW Section 12-18-31, swabbed 65 bbls. of oil in 24 hours through 2-inch tubing set at 3,516 feet. Pay was found at 3,515 feet, total depth 3,600 feet.

Paton Brothers No. 1 Irwin, C SE SE Section 5-18-31, filled with water at 3,738 feet, total depth, and was abandoned.

Dominion Oil & Gas Co. No. 3 Johnson, C NE SW Section 35-16-31, was junked and abandoned at total depth of 3,950 feet.

Lea County

Barnsdall Oil Co. No. 1 Humble-State, C NE SE Sec. 33-16-36. S.D.O. 4,997 ft.
Repollo Oil Co. No. 1 State, Lease 182, C S½ SE SW Sec. 31-16-37. T.D. 4,760 ft.; swb. and F. 477 B.O. in 21 hrs. and died.
Continental Oil Co. No. 1-A Sanderson B-14, C N½ NW NW Sec. 14-20-36. W.O.C. 1,443 ft.
Continental Oil Co. No. 1 State H-34, C SE SE Sec. 34-17-34. W.O.C. 4,212 ft.
Continental Oil Co. No. 4 State H-35, C SE NW Sec. 35-17-34. T.D. 4,710 ft.; acd. and F. 9 B.O.P.H.
Continental Oil Co. No. 5 State H-35, C SW NE Sec. 35-17-34. C.&P.
Humble O. & R. Co. No. 2-J State, C NW SW Sec. 19-17-35. T.D. 4,765 ft.; acd. twice and swb. 12 B.O.P.H. for 6 hrs.
Humble O. & R. Co. No. 1-K State, C SE SE Sec. 28-17-35. Drlg. 3,754 ft.
Humble O. & R. Co. No. 2-K State, C NW NE Sec. 32-17-35. W.O.C. 240 ft.
Humble O. & R. Co. No. 3-K State, C NE SE Sec. 28-17-35. Loc.
Magnolia Pet. Co. No. 4-M State, C SE NW Sec. 34-17-35. T.D. 4,242 ft.; W.O.C.
Magnolia Pet. Co. No. 2-J State, C NW SE Sec. 22-17-34. Drlg. 3,488 ft.
Magnolia Pet. Co. No. 23 State-Bridgss, C NW SW Sec. 24-17-34. Drlg. 4,575 ft.
Magnolia Pet. Co. No. 24 State-Bridges, C SW SW Sec. 17-17-34. Drlg. 4,250 ft.
Magnolia Pet. Co. No. 25 State-Bridges, C NE SE Sec. 26-17-34. Drlg. 2,825 ft.
Maljamar O. & G. Co. No. 2-B Baish, C NE NE Sec. 27-17-32. T.D. 2,602 ft.; acd. and rec. S.S.O.; to D.D.
Maljamar O. & G. Co. No. 1-B Mitchell, C NE SE Sec. 20-17-32. T.D. 3,591 ft.; W.O.S.T.
Maljamar O. & G. Co. No. 6 Mitchell, C SW NE Sec. 20-17-32. Drlg. 3,801 ft.; 400 ft. O.I.H.
Maljamar O. & G. Co. No. 1-B State, C SW SE Sec. 16-17-32. T.D. 4,125 ft.; C.O. to bttm.
Ohio Oil Co. No. 2 State-Staplin, C NE SW Sec. 30-17-35. Sndg.
Phillips Pet. Co. No. 12 Santa Fe, C NE SW Sec. 28-17-35. T.D. 4,700 ft.; C.O. and tstg.
Phillips Pet. Co. No. 15 Santa Fe, C NE NE Sec. 28-17-35. T.D. 4,700 ft.; C.O. 4,540 ft.
Phillips Pet. Co. No. 19 Santa Fe, C NW NE Sec. 35-17-35. T.D. 4,780 ft.; P.B. 4,687 ft.; S.D.O.
Phillips Pet. Co. No. 20 Santa Fe, C SW SW Sec. 27-17-35. Drlg. 973 ft.
Phillips Pet. Co. No. 21 Santa Fe, C NE NE Sec. 33-17-35. Drlg. 3,351 ft.
Phillips Pet. Co. No. 23 Santa Fe, C SW SW Sec. 26-17-35. Drlg. 1,717 ft.
Phillips Pet. Co. No. 24 Santa Fe, C NE NE Sec. 34-17-35. C.&P.
Phillips Pet. Co. No. 25 Santa Fe, C NW SE Sec. 30-17-35. Drlg. 2,340 ft.
Phillips Pet. Co. No. 26 Santa Fe, C NE SW Sec. 29-17-35. C.&P.
Repollo Oil Co. No. 2 State, Lse. 197, SE NE SE Sec. 6-17-34. Drlg. 4,068 ft.
Shell Pet. Corp. No. 1-C State, C NE SE Sec. 24-17-34. T.D. 4,733 ft.; shot; C.O. and swb. 30 B.O. in 3 hrs.
Shell Pet. Corp. No. 1-V State, C NE SE Sec. 21-17-35. Rng. tbg. 4,680 ft.
Standard Oil Co. of Texas No. 3 State, Lse. 3, C NE NW Sec. 32-17s-35. Loc.
Standard Oil Co. of Texas No. 4 State, Lse. 4, C NW SW Sec. 27-17-35. Drlg. 4,271 ft.
Stanolind O. & G. Co. No. 2 State, C SE NW Sec. 1-17-36. Loc.
Texas Co. No. 1-T State, C SE NE Sec. 25-17-34. T.D. 4,725 ft.; W.O. pump.
Twin Oil Corp. No. 1-D State, C SW NE Sec. 30-17-35. T.D. 4,700 ft.; swb. 30 B.F.P.D.; 20% b.s.
Fullerton Oil Co. No. 1-A Walker, C SW NW Sec. 18-18-32. Drlg. 860 ft.
Phillips Pet. Co. No. 16 Santa Fe, C NW SW Sec. 5-18-35. T.D. 4,750 ft.; C.O. 4,632 ft.
Great Western Prod. Co. No. 2 Bordages, NE SE NW Sec. 33-19-37. Drlg. 1,300 ft.
Shell Pet. Corp. No. 2 Foster, SE SW SE Sec. 34-19-36. T.D. 3,953 ft.; rng. tbg.
Continental Oil Co. No. 2 Britt B-10, C W½ NW SW Sec. 10-20-37. W.O.C. 1,280 ft.
Continental Oil Co. No. 4 Britt B-15, NW SW SW Sec. 15-20-37. Drlg. 2,060 ft.
Continental Oil Co. No. 3 Sanderson B-14, C E½ SE SW Sec. 14-20-36. W.O.C. 1,290 ft.
J. M. Rush No. 4 State A-20, NW SE SE Sec. 20-20-37. Loc.
Texas Co. No. 16 Lieu-Lands, C NE SW Sec. 20-20-37. Drlg. 3,040 ft.
Aloco Oil Co. No. 1 Carson, C SW SE Sec. 28-21-37. T.D. 3,560 ft.; R.U.R.
Bryant-Drilexco No. 2 State, SE SW SE Sec. 12-21-35. Loc.
Gulf Oil Corp. No. 7 McCormack, C NE SE Sec. 32-21-37. Loc.
Gulf Oil Corp. No. 4 Ramsey, C SE SE Sec. 35-21-36. Loc.
Magnolia Pet. Co. No. 1 Marshall, C SW NW Sec. 34-21-27. Drlg. 3,600 ft.
Francis C. Wilson No. 3 State, NW SE NE Sec. 7-21-35. T.D. 3,855 ft.; P. B. 3,827 ft.; only S.S.O. after acd.
J. C. Clower No. 1-B Manda, NE NE NW Sec. 28-22-37. T.D. 3,681 ft.; F. 30 B.O.P.D.
Danglade & Clower No. 1-B Glier, C SE NW Sec. 33-22-37. T.D. 3,402 ft.; cmtg. 7-in. at 3,395 ft.
Continental Oil Co. No. 4 Lockhart, B-1, C W½ SW NE Sec. 1-22-36. Drlg. 2,580 ft.
Continental Oil Co. No. 1 State F-1A, C W½ SE NE Sec. 1-22-35. Drk.
Continental Oil Co. No. 4 State J-2, C NE NE Sec. 2-22-36. T.D. 3,845 ft.; F. 90 B.O. in 4 hrs.; Rng. tbg.
Continental Oil Co. No. 5 State J-2, C SE SE Sec. 2-22-36. Loc.
Continental Oil Co. No. 5 State E-17, C W½ NW SW Sec. 17-22-36. Drk.
Olean Pet. Co. No. 2 Farrell, SW SE SE Sec. 22-22-37. Drlg. 3,644 ft.
Texas Co. No. 2-B Fally, C SE SW Sec. 8-22-37. Drlg. 2,775 ft.
Texas Pacific Coal & Oil No. 13-A State, C NE NE Sec. 11-22-36. Drlg. 3,680 ft.
Two States Oil Co. No. 4-B Cole, C SW NW Sec. 16-22-37. Drlg. 1,100 ft.
Walter Donnelly No. 1 Davis, C SE NW Sec. 33-23-37. T.D. 3,600 ft.; F. 11 B.O.P.D.
Great Western Prod. No. 2-B Leonard, C NW NW Sec. 32-23-37. C.&P.
R. Olson No. 1 Blinebry, C SW SW Sec. 29-23-37. Drlg. 3,050 ft.
Continental Oil Co. No. 4 Jack A-20, C SW NE, Sec. 20-24-37. C.&P.
Continental Oil Co. No. 2 Jack B-27, C SW NE, Sec. 27-24-37. C.&P.
North Shore Corp. No. 1 Woolworth, NE NE NW Sec. 33-24-37. T.D. 3,340 ft.; Drlg. plug.
North Shore Corp. No. 2 Woolworth, SE SE NW Sec. 33-24-37. Drlg. 3,483 ft.
Parker Drlg. Co. No. 3 Erwin, C W½ NE SW Sec. 35-24-37. T.D. 3,460 ft.; F. 10 B.O. in 8 hrs.; est. 3,000,000 cu. ft. gas.
Phillips and Pure No. 5 Woolworth, C SW SE Sec. 33-24-37. C.&P.
Phillips & Pure No. 6 Woolworth, C NE NE Sec. 33-24-37. W.O.C. 334 ft.
Schermerhorn Oil Co. No. 4 Woolworth, C NE SE Sec. 28-24-37. Drlg 3,350 ft.
Schermerhorn Oil Co. No. 5 Woolworth, NW SW NE Sec. 28-24-37. Drlg. 1,800 ft.
Sam Weiner No. 2 Woolworth, SW NW SW Sec. 33-24-37. T.D. 3,214 ft.; tools stk.
Weir Drlg. Co. No. 3 Woolworth, NE SW SW Sec. 28-24-37. Drlg. 1,155 ft.
Culbertston & Irwin No. 3 Henry, SW SW SW Sec. 26-25-37. Loc.
Geo. F. Getty No. 1-G State, NW NW NW Sec. 2-25-37. T.D. 3,582 ft.; P.B. 3,502 ft.; S.I. for storage.
Gulf Oil Corp. No. 6 Stuart, C NW NW Sec. 11-25-37. Drlg. 2,755 ft.
Italo Pet. Corp. No. 1 Carlson B-27, NE NW NE Sec. 27-25-37. T.D. 3,364 ft.; P.B. 3,354 ft.; swb. & F. 70 B.O.P.D.
Italo Pet. Corp. No. 1 Indian Pet. Corp. B-5; NW NE NE Sec. 5-25-37. Drlg. 2,855 ft.
Italo Pet. Corp. No. 2 Indian Pet. Corp. B-5, NE SE NE Sec. 5-25-37. W.O.C. 1,265 ft.
Richmond Drlg. Co. No. 1-A State, C NW SW Sec. 2-25-37. Drlg. 3,359 ft.
Richmond Drlg. Co. No. 2-A State, C SW SW Sec. 2-25-37. Drlg. 625 ft.
Sam Weiner No. 3 Smith, C N½ NE SE Sec. 4-25-37. Drlg. 3,285 ft.

Eddy County

Aston & Fair, Inc., No. 1 Hudson, C NE NE Sec. 18-17-31. Drlg. 570 ft.
Danciger O. & R. Co. No. 1-B Turner, CEL NE SE Sec. 17-17-31. T.D. 3,530 ft.; swbs. 35 B.O. in 12 hrs.
Hammond & Sons No. 1 Ployhar-State, SW SW SE Sec. 16-17-28. Drlg. 1,237.
J. O. and J. H. Hammond No. 1 Paris, NE NW NW Sec. 5-17-29. S.D.O. 25 ft.
English & Harmon No. 1 Stogner, C NW SE Sec. 31-17-31. T.D. 4,060 ft.; S.D.O.
P. B. English No. 1 Saunders, SE SE SE Sec. 13-17-27. T.D. 460 ft.; S.D. rprs.
Etz Bros. No. 5 State, SE NE SE Sec. 16-17-30. T.D. 3,300 ft.; rng. tbg. to treat.
Flint Prod. Co. No. 1-L Dexter, SE NW SE Sec. 15-17-30. Drlg. 3,110 ft.; 500 ft. O.I.H.
Jim E. Hughes No. 2 Brooks, NE NW NE Sec. 19-17-28. R.U. mch.

F. G. Keyes No. 3 Red Gulch, NW NW NE Sec. 16-17-28. T.D. 1,221 ft. Drlg. plug.
Ohio Oil Co. No. 4 State-McCallister, Sec. 25-17-34. W.O.C. 510 ft.
C. S. Powell No. 1 Smith, NW NW NE Sec. 6-17-29. Drlg. 2,056 ft. S.S.O.
Red Lake Oil Co. No. 1 State, NE NE SE Sec. 20-17-28. Drlg. 1,483 ft.
H. J. Steinberger No. 1 Hastie, SE NE SW Sec. 18-17-38. Drlg. 498 ft.
Adkinson Oil Co. No. 1 Brainard, SE SW SE Sec. 5-18-27. Drlg. 1,365 ft.
Barney Cockburn No. 1 State-Graham, C NE NE Sec. 16-18-31, M.I. rot.
Farmer & Tallmadge No. 1 Hubbell, NE SW Sec. 4-18-25 S.D.O. 380 ft.
Franklin Pet. Corp. No. 1 Ballard, NE NE SE Sec. 1-18-29. Drlg. 1,020 ft.
Green Bay Oil Co. No. 1-A Johnson, C SE SE Sec. 11-18-31. Drlg 2,245 ft.
Yates et al No. 1 Yates, C NW SW Sec. 6-18-30. T.D. 2,874 ft.; S.I. for storage.
Harvey E. Yates No. 1 Travis, NE SE SE Sec. 6-18-29. Drlg. 1,097 ft.
Carper Drlg. Co. No. 1 Quillen, C NW NE Sec. 12-19-31. Drlg. 1,135 ft.
Geo. E. Robb No. 1 Cannon, C SW SE Sec. 4-19-30. T.D. 210 ft.; S.D.O.
Geo. E. Robb No. 1 Vandagriff, SW NE Sec. 6-19-31. T.D. 800 ft.; S.D.O.
R. C. Underwood No. 1 Quillen-Bruce, NE NE SE Sec. 4-19-31. Drlg. 3,000 ft.
Martin Yates, Jr., No. 1 Bowers, SW SE SE Sec. 31-19-27. T.D. 1,180 ft.; est. 25-40 B.O.P.D.; tstg.
Trojan Oil Co. No. 1 Grant, SW SW NE Sec. 33-20s-25e. S.D.O. 408 ft.
C. F. Ingram No. 1 Page, NE NE SW Sec. 15-21-28. T.D. 2,978 ft.; fsg.
Barnett Oil Dev. Co. No. 1 King, C NW SE Sec. 23-26-30. Drlg. 1,712 ft.

Chaves County

Nay Hightower No. 1 Billingslea, C SW NE Sec. 28-11-30. Drlg. 2,437 ft.
E. J. Fisher No. 1 Foster, C NW NW Sec. 7-15-26. T.D. 1,281 ft.; S.D.O.

De Baca County

N. E. Woods No. 1 Jones, C NE SW Sec. 17-4n-20. T.D. 620 ft.; S.D. rprs.
James D. Ward No. 1 Summers, SE NE SW Sec. 15-4n-24e. T.D. 680 ft.; S.D.O.

Roosevelt County

Shell Pet. Corp. No. 1 Harwood, C S½ SE SE Sec. 27-7s-35e. T.D. 5,151 ft.; drlg. plug at 4.611 ft.; to D.D.

NORTHWEST NEW MEXICO

Bernalillo County

Norins Realty Co., Inc., No. 2 Pajarito, Sec. 22-9n-1e. Drlg. 1,050 ft.
Norins Realty Co., Inc., No. 2 North Albuquerque, NE SE NW Sec. 10-11n-4e. S.D. 4,550 ft.

McKinley County

S. Dysart No. 3-A Govt., NE NW NE Sec. 14-14n-10w. Cmtd. 12½-in. 1,320 ft.; 100 ft. sat.
Pet. Products Co. No. 3 Santa Fe, NE NW Sec. 1-17n-9w. T.D. 1,590 ft.; rng. csg.

Rio Arriba County

Oil City Pet. Co. No. 2 Wirt-Sanchez, C Sec. 12-31-2e. M.I.

San Juan County

Continental Oil Co. No. 86 Rattlesnake, 1,320 ft. from NL and 1,500 ft. from EL Sec. 2-29n-19w. S.D. 846 ft.
San Juan O. & G. Co. No. 2 Cassidy, NW NW SW Sec. 18-29n-11w. Drlg. 400 ft.
Kutz Deep Test, Inc., No. 1 Govt., C NW NW Sec. 28-28n-10w. Drlg. 350 ft.
Jack Amenda No. 1, NE NE Sec. 14-29n-13w. Drlg. 625 ft.
Al Greer No. 2 fee, SW SE SW Sec. 10-30-11w. S.D. 830 ft. for csg.
Anna Oil Corp. No. 6 Govt., SW NE NE Sec. 33-30n-11w. S.D. 1,885 ft.; W.O. csg.; S.O. in Farmington sd. but will D.D. to Picture Cliff.
Ted Whetstine No. 1 McGee, NW NW Sec. 20-30n-11w. S.D. 434 ft. for mat.
Bullock & Noland No. 1 Bunce, SW SE Sec. 24-29n-1w. S.D. 965 ft.; (C.D.).

Valencia County

Joiner Oil Corp. No. 1 San Clemente, C NE SE Sec. 23-7n-1e. Drlg. 2,500 ft.; 10-in. 550 ft.

COLORADO

Wildcatting on the public domain this year will be influenced to a large extent by the outcome of legislation proposed in Congress and the attitude taken by the Department of the Interior in regard to leasing regulations. In the meantime the field men of the department are making a study of administrative and technical questions involved in the leasing of government land for mineral development. A week's conference starts at Salt Lake City today which is being attended by the field men of the conservation branches of the department. Denver is represented at the conference by Dr. C. E. Dobbin, geologist in charge of the mineral classification division; Charles E. Erdman, geologist, and William B. Kramer, assistant petroleum engineer; J. J. Bourquin, district mining supervisor of the mining division; F. W. Calhoun, associate mining engineer, and J. D. Turner, assistant mining engineer; and J. B. Mitchell, district engineer of the oil and gas leasing division. At present there are approximately 13,000,000 acres of public land, including Indian land, under lease for such development. During the last fiscal year, these lands brought a total income to the lessees of about $90,000,000, and revenues to the government of approximately $11,000,000.

Archuleta County

Boone Dev. Co. No. 1 Newton, SE NW SE Sec. 18-33n-1e. Drlg. below 800 ft.
Pagosa Oil & Dev. Co. No. 1 Macht, C Sec. 32-36-1w. T.D. 2,460 ft.; fsg. tools; through Dakota series.
Axelind Oil Co. No. 1, Sec. 11-32n-2e. Drlg. below 700 ft.

Boulder County

Reynolds & Roher No. 1 Thomas, SW SW Sec. 17-1n-70w. Drlg. 605 ft.

Fremont County

Stanley Thomas No. 1 Rickwalt, SE SE Sec. 2-19s-70w. S.D. 2,460 ft.

Garfield County

Roaring Fork Oil Co. No. 1 Patterson, C NE Sec. 36-7s-88w. S.D. 2,008 ft. for winter after W.S.O. with 5⅛-in. at 1,757 ft.

Huerfano County

J. W. Tomkins & Sons No. 2 Presser, SE SE SE Sec. 3-29s-69w. Drlg. 315 ft.; 10-in. at 204 ft.

La Plata County

N. Spatter No. 1-X Bryce, SE SW SW Sec. 31-33n-9w. T.D. 2,250 ft.; U.R. 8¼-in. at 2,230 ft.

Las Animas County

Hulme-Johnston-Allison No. 1 Azar, SE SE NW Sec. 27-34s-58w. T.D. 1,285 ft.; W.O. 10-in.; S.G. 1,279-83 ft.

Logan County

West Plains Dev. Co. No. 1 Sheldon, SE NW SE Sec. 3-10s-55w. S.D. 190 ft. in 20-in. hole.

Moffat County

C. R. Privett No. 1 Sutton, NE NE SW Sec. 1-5n-96w. T.D. 1,145 ft.; fsg.; U.R. lug.
Mackinnie Oil & Drlg. Co. No. 1 Coles, SW SW SE Sec. 1-3n-92w. Drlg. 3,060 ft.; set 6¼-in. at 3,040 ft.

Montezuma County

McElmo Oil Co. No. 1 West, NE NW NW Sec. 31-36s-17w. S.D. 4,917 ft.

Park County

South Park Oil Co. No. 1 Lemar, NE NE SE Sec. 34-11s-75w. Drlg. 6,755 ft.

Prowers County

Continental Oil Co. No. 1 Ruby, C NE NW Sec. 31-21s-44w. T.D. 5,437 ft. in white L.; drlg. on iron at 5,430 ft.; 7-in. hung at 5,204 ft.

Pueblo County

C. E. Puckett No. 1 Barber, NW Sec. 35-21s-66w. S.D. 870 ft. for csg.
Eden O. & G. Co. No. 1 Horse Creek, SW SE Sec. 29-19s-64w. T.D. 2,060 ft. in top Morrison; S.S.O.; will U.R. 6¼-in. from 2,043 ft. to bttm. and cmt.

Rio Blanco County

Buford Oil Co. No. 1 Govt., C SW SW Sec. 16-1n-91w. Drlg. gr. sh. below 3,618 ft.

In oil field service there is need for more different types and sizes of automotive equipment, perhaps, than in any other industry. Mammoth big fellows *with traction and power on every wheel,* to haul the heaviest rigs and equipment to location, no matter in what out of the way place it may be. Lighter *all-wheel-drive* trucks to bring in tools and supplies through deep sand, mud or snow. Station wagons to transport executives and crew to and from the field. Marsh Buggies to traverse swamps and marshes. Mounts for seismograph scouting, out beyond the horizons of travel.

MARMON-HERRINGTON has them all. They're all *all-wheel-drives,* from smallest Ford pickups and passenger cars, converted to *all-wheel-drive,* to tremendously big trucks, with power and traction on four or six wheels, capable of hauling 25-ton loads over the worst kind of going. Tell us what you need, and let us send literature.

USED IN EVERY MAJOR OIL FIELD THROUGHOUT THE WORLD

Marmon-Herrington all-wheel-drive equipment for oil field service is engineered and built by men who know what is required, *by practical experience.* Hundreds of these vehicles are in constant service in Europe, Asia, South America and other foreign fields, as well as in the United States. You'll find that Marmon-Herrington speaks your language and is in position to furnish exactly what you need, with complete understanding, and at minimum cost.

Cable Address, MARTON

MARMON-HERRINGTON COMPANY, INC.
INDIANAPOLIS, INDIANA, U. S. A.

Routt County

Steamboat Springs Drlg. Synd. No. 1 Brown, C NW NE Sec. 1-6n-86w. S.D. 1,790 ft.

WYOMING

Big Horn County

Frank S. Scott No. 1 Robertson, SE SE SE Sec. 6-54n-93w. Spd. to 14 ft. and S.D. to comp. R.U.
Libby-Keoughan Interests No. 1 Sheets-Govt., SE NE SE Sec. 9-55n-96w. Drlg. 2,720 ft.; 8¼-in. at 2,690 ft.
A. L. Rankin No. 1 Karjala-Rankin, C SW NW Sec. 10-54n-94w. Drlg. 635 ft.
Prescott & Mileski No. 1 Govt., NE NW SW Sec. 15-1n-93w. S.D. 1,190 ft.; repairs.
Clifford S. Johnson No. 1 Johnson, CEL NW NW Sec. 24-51n-93w. Drlg. 400 ft.
Joan Oil Co. No. 1 Howell, NE NW NE Sec. 32-55n-97w. S.D. 2,718 ft.

Campbell County

Fyre & Kreiner No. 2, CSL NW NW Sec. 6-50n-72w. Landed 5⅛-in. on bttm. at 823 ft. and S.D.

Carbon County

Sinclair-Wyo. Oil Co. No. 2-A Mahoney Unit, C SW NE Sec. 34-26n-88w. Drlg. 995 ft.; 13⅜-in. cmtd. 388 ft. with 250 sacks.
Ohio Oil Co.-California Co. No. 7 Union Pacific-Johnson, CEL NE SW Sec. 23-21n-79w. T.D. 5,836 ft.; dry in Sundance; P.B. to Dakota to test.
Producers Oil Co. No. 1 Lake Valley, 200 ft. CEL Sec. 14-20n-88w. S.D. 1,916 ft.

Lincoln County

H. C. Harris et al No. 1 Govt., SE NW NW Sec. 23-21n-117w. T.D. 1,096 ft.; fsg. tools.

Natrona County

General Pet. Corp. No. 2 State, NW SE NE Sec. 16-35n-77w. Drk.; foundations run.
General Pet. Corp. No. 1 State, NW NE SE Sec. 16-35n-77w. Cg. 7,940 ft. for Muddy sd.

Niobrara County

The Adams Oil & Gas Co.-Felmont Corp. No. 1 Baker, which marks an extension of the Leo pool in Lance Creek, was deepened 10 feet to 5,636 feet and swabbed 55 bbls. in approximately 2½ hours. At 5,626 feet it was acidized twice with a total of 4,000 gallons, after which it swabbed 135 bbls. in 24 hours. Top of the pay was at 5,606 feet. It is still testing.

The Ohio Oil Co. No. 6 Leo-O.P.C.-16, is a near completion at 5,576 feet, total depth. It topped the Leo zone at 5,530 feet, where the 7-inch was cemented, and had saturated Leo sand at 5,536-76 feet, with a break at 5,541-43 feet. It is an inside location.

The Argo Oil Co. is going back into its No. 3 Ford, SW SW NW Section 33-36n-65w, which was completed for 75 bbls. per day in the Sundance at 4,045 feet in 1937, and will deepen it to the Leo sand.

Argo Oil Co. No. 3 Ford, SW SW NW Sec. 33-36n-65w. T.D. 4,045 ft.; prep. to D.D.
Ohio Oil Co. No. 1 Leo-O.P.C.-7, NW NW SE Sec. 35-36n-65w. T.D. 5,641 ft.; pulling 8-in. and scrapping walls.
Ohio Oil Co. No. 5 Rohlff, 100 ft. E of C E½ Sec. 32-36n-65w. Rig; W.O. equip.
Continental Oil Co. No. 14 Tom Bell, C NW SW Sec. 31-36n-65w. Drlg. sh. 2,848 ft.
Continental Oil Co. No. 3 Apex-4, SE SW NW Sec. 35-36n-65w. Drlg. L.&anhy. 5,313 ft.
Argo Oil Co. No. 9 Elliott, NW SE SE Sec. 5-35n-65w. T.D. 3,979 ft. in sat. sd.; 7-in. cmtd. 3,931 ft.; tstg.
Ohio Oil Co. No. 6 Leo-O.P.C.-16, NW NE SW Sec. 35-36n-65w. T.D. 5,576 ft.; prep. to test.
F. F. Hintze et al No. 1 Wright-Govt., NW NW SE Sec. 30-36n-63w. T.D. 3,300 ft.; cmtg. to regain circ.
J. E. Manning No. 1 Hewitt-Govt., NW SW SW Sec. 4-35n-65w. Loc.
Cow Gulch Oil Co. No. 1 MaGoon, NE NE Sec. 33-35n-64w. T.D. 2,100 ft.; C.O. to D.D.
Fall River Roy. & Prod. Co. No. 1 Govt., CSL SE SE Sec. 35-40n-61w. T.D. 1,000 ft.; rec. collapsed pipe; rerng. 12½-in.
H. D. Moore et al No. 1 Bergrem, NW Sec. 23-35n-63w. Drlg. 1,900 ft.
Adams O. & G. Co. No. 1 Baker, NW NE SW Sec. 8-35n-65w. T.D. 5,636 ft.; tstg.

Park County

Dry Creek Oil Co. No. 1 State, C NE NW Sec. 16-50n-100w. S.D. 200 ft.
E. J. Preston No. 1, SW SW Sec. 26-58n-98w. M.I.M.
Blue Ridge Co. No. 1 Mau, NE NE SW Sec. 25-58n-98w. Cmt. 12½-in. 100 ft.; drlg. plug.
Resolute Oil Co. No. 2 State, C SW SW Sec. 16-57n-101w. T.D. 8,690 ft.; C.D.; 6⅝-in. 8,330 ft.; drlg. plug.

Platte County

Bill Griffin et al No. 1, NE SE NE Sec. 18-30n-67w. S.D. 550 ft.

Sublette County

The Wyoming Petroleum Co. No. 1 Budd, Dry Piney district, has succeeded in mudding in gas at 1,695 feet, total depth. It will run casing to bottom as soon as ice is cleared away from rig. The flow, estimated at 10,000,000 to 20,000,000 cu. ft. per day, is believed to be coming from around 800 feet. This well is 7 miles to the northeast of the Texas Co.-Frontier Petroleum Co. well which also had a blowout at approximately the same horizon and is still conditioning the hole to run pipe and shut down until spring.

Texas Co.-Frontier Pet. Co. No. 1 Unit, SE SE SW Sec. 1-28-11w. T.D. 6,247 ft.; C.O.
Yellowstone Oil Co. No. 1, 200 ft. N of S line of the H. L. Budd rnh., SE SE Sec. 31-13n-112w. Drlg. 500 ft.
Progressive Oil Co. No. 1 Haddenham, C NE SE Sec. 21-28n-113w. S.D. 835 ft.
Wyoming Pet. Corp. No. 1 Budd, C NE NE Sec. 10-29n-113w. T.D. 1,695 ft. mudded in; prep. to run csg.

Sweetwater County

Sinclair-Wyo. Oil Co. No. 81, SW NW NW Sec. 11-26n-90w. T.D. 2,043 ft.; swb. 61 B.O. and 250 B.W. in 11 hrs. at 2,040 ft.
Sinclair-Wyo. Oil Co. No. 82, NE SW SW Sec. 11-26n-90w. Drlg. 1,134 ft.

Weston County

Selby & Langford No. 1, CNL NW SE Section 6-46n-63w, Osage field, was completed at 545 feet for 2 bbls. per day. Bert Higgins No. 7, NE NE SE Section 5-46n-63w, was completed for 2 bbls. in shale at 385 feet.

T. R. Ragland and Osage Oil Trust No. 3 Government, formerly carried as the Conway Oil Co., cored saturation at 2,477-2,502 feet in sand, shells and black shale and is preparing to run casing and test. Location is 1½ miles north of Conway No. 1 Government, the discovery well in the Dewey district, which was completed for around 20 bbls. per day in horizon now being tested in No. 3.

T. R. Ragland-Osage Trust No. 3 Govt., C NW SW Sec. 31-42n-60w. T.D. 2,502 ft.; prep. to run csg. and test.
Kroker et al No. 2, CNL NE NW Sec. 31-47n-63w. M.I.M.; (first report).
Whedon et al No. 1, C SW NE Sec. 21-46n-64w. Drlg. below 3,474 ft.
Lem Johnston No. 1, NW SW Sec. 24-44n-63w. Drlg. 1,700 ft.
W. A. Lease et al No. 1, SW SW Sec. 36-45n-63w. M.I.M.; (first report).

MONTANA

Gasoline sales in Montana in December were 9,648,265 gallons, of which 7,006,719 gallons were refined in the state and 2,641,456 gallons were imported. Exports amounted to 2,056,995 gallons, leaving net sales in the state of 7,591,270 gallons.

Big Horn County

Buzetti & Corkins No. 1, NE NW Sec. 23-1s-23e. Some mat. on ground.

Blaine County

Walter Drought No. 1 Stam, CSL SW SE Sec. 20-31n-18e. Drlg. 950 ft.; (formerly G. R. Teeters).

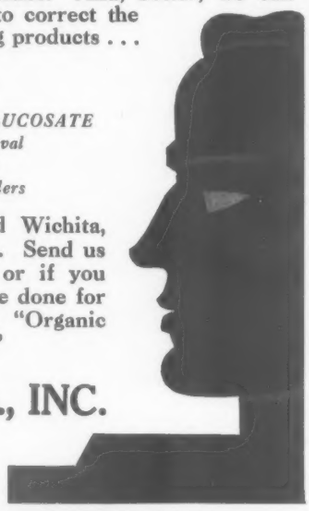
Carbon County

Valentine M. Kirk et al No. 1 Robinson, SW SW NW Sec. 2-7s-21e. Cmtd. 10-in. at 2,021 ft. and S.D. until spring.
Alex Beaton No. 1, CSL SE SE Sec. 23-6s-23e. T.D. 1,580 ft.; landed 6¼-in. on bttm.

WE READ WATER

Every drop of water has a story to tell us and we know how to read it and translate it so as to answer the many difficulties it is bringing your refinery. The story tells a battle against efficiency in your plant . . . corrosion, scaling, too much of this chemical, too little of that. We read the difficulties. And, better, we can tell the answer, and we have the organic chemicals to correct the water. Known throughout the Nation are these Haering products . . .

CHROM GLUCOSATE	*BETA GLUCOSIDE*
For Corrosion Prevention	*For Scale Prevention*
SODIUM GLUCOSATE	*HEMI PHOSPHO GLUCOSATE*
For pH Adjustment	*For Rapid Scale Removal*
SULPHO GLUCOSATE	*PYRO GLUCOSATE*
For Oxygen Removal	*For High Pressure Boilers*

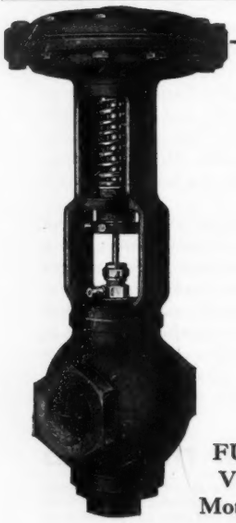


Our laboratories located in Chicago and Wichita, Kansas, are ready to serve you over-night. Send us your water problems, sample of water, or if you want to know what Haering Products have done for other refineries, write for our booklet "Organic Methods of Scale and Corrosion Control."

D. W. HAERING & CO., INC.

3410 W. Monroe St.

CHICAGO



Effective with Either Pressure Control or Flow Control . . . . .

The gradual-opening valve here shown is dependable with flow controllers, with instrument-type auxiliary-controlled pressure regulators, and with many other forms of refinery equipment. Has many applications also in other industries. Made for either direct action (closed by diaphragm pressure) or indirect action (opened by diaphragm pressure). Sizes ½ inch up, all with ample diaphragm area to give positive unfailing response. Write for Bulletin 3259.

FULTON V-PORT Motor Valve

The CHAPLIN-FULTON MFG. CO.

28-40 PENN AVE. CF PITTSBURGH, PA.

R. C. Tarrant No. 2, SE NW Sec. 4-6s-18e. Drlg. 3,060 ft.
Henderson Prod. Co. No. 1-H-11 Elk 11, SE SE NW Sec. 35-9s-23e. S.D. 1,810 ft.
Miracle Oil Co. No. 2 Govt., CWL NE SE Sec. 4-6s-23e. S.D. 2,381 ft.

Cascade County

E. B. M. Oil Co. No. 1 Betts, CSL NW SE Sec. 34-18n-4e. S.D. 1,250 ft.

Choteau County

Security Pet. Corp. No. 1 Johnson, C NE Sec. 23-26n-3e. S.D. 1,991 ft.; S.D. for 6⅝-in.; Sunburst 1,935-53 ft.

Dawson County

Frank C. Hughes No. 1 fee, NW NE SE Sec. 5-14n-55w. Drlg. 1,065 ft.

Daniels County

White Tail O. & G. Co. No. 2 Wiley, NW NW NW Sec. 10-36n-50e. Drlg. 1,928 ft.

Fergus County

Baughman & Singley No. 1 Skaggs, C NW SW Sec. 7-15n-20e. S.D. 1,080 ft. (C.D.); in lower Quadrant.
Emmons et al No. 5 Stocker, SW NW SW Sec. 24-22n-18e. Drlg. 950 ft.

Glacier County

Nadeau Brothers No. 1 Government, NW SW NW Section 25-37n-5w, three-fourths of a mile southeast of the Yukon Oil Co. No. 1 Lungren, the discovery well in the Moulton sand in North Cut Bank, was plugged and abandoned after failing to improve conditions by shooting. The Sunburst sand was shot at 2,735-52 feet with 30 quarts without results. The Moulton sand then was shot with 60 quarts at 2,652-66 feet.

There were no completions or new operations in the field.

Glacier Prod. Co. No. 2 Scheuren, C SW SW Sec. 20-33n-5w. T.D. 160 ft.; str. cr. H.
Glacier Prod. Co. No. 5 State, C NW NW Sec. 16-35n-5w. Cmtd. 10¾-in. at 553 ft.; Colo. 530 ft.
Glacier Prod. Co. No. 3 O'Brien, C SW SW Sec. 32-34n-5w. Drlg. 2,100 ft.
Santa Rita O. & G. Co. No. 3 Lander, C S½ SE Sec. 16-35n-6w. Drlg. 2,570 ft.

Judith Basin County

Fletcher E. Hunt No. 1 Doven, SE NE NW Sec. 30-14n-15e. Spd. and S.D.

Park County

Ben Ryan et al No. 1 Burgess, SE SW NW Sec. 28-2s-11e. Drlg. 1,550 ft.

Petroleum County

H. Clark Rowland No. 1 Brundidge-Mink, SE NW Sec. 35-14n-25e. S.D. 110 ft.
Watson Oil Co. No. 1 Austed, SW NW SE Sec. 22-13n-28e. U.R. 10-in. to 1,154 ft.
O. B. Canfield No. 2 Govt., SE NE NE Sec. 21-17-24e. S.D. 780 ft.

Richland County

W. M. Fulton No. 1 Richardson, SW SW SE Sec. 29-26n-52e. Drlg. 540 ft.; small S.W. at 435 ft.

Teton County

Zodiac Oil Co.-Gulf States Oil Co. No. 1 Kellogg, NE NW NE Sec. 33-28n-5w. S.D. 2,020 ft. for D.P.
Gulf States Oil-Zodiac Oil Co. No. 1 Coffee-Wallenstein, SW SW SW Sec. 5-27-5w. S.D. 2,525 ft. until spring.

Toole County

The Producers Refining Co., which was organized last year by a group of producers in the Kevin-Sunburst field in an effort to provide a market for its crude following the discontinuance of exports to Canada, is reported to have made a deal with the Socony-Vacuum Oil Co. for the construction of a 2,000-bbl. refinery at Shelby. While neither side has confirmed the reports, it is ascertained that there is substantial foundation to them and that an announcement may be forthcoming as soon as agreements are signed and exchanged. It is probable that the plant will include a unit to operate on the Houdry process. Socony-Vacuum imports around 400,000 gallons of gasoline per month into Montana.

Kevin-Sunburst had three completions. Kluth and others No. 2 Merrill, SW cor. Section 18-35n-2w, is pumping 10 bbls. of oil per day with no water at 1,676 feet, total depth, from the contact at 1,670-75 feet.

The Big West Oil Co. No. 9 Gunderson, NW SE NW Section 19-35n-2w, is pumping 7 bbls. of oil per hour and no water at 1,608 feet, after plugging back from 1,654 feet and acidizing with 500 gallons.

The Superior Petroleum Co. No. 11 Government, CEL NW SW Section 12-35n-3w, has 300 feet of oil in the hole at 1,524 feet, total depth, but has not been tested. It had the Sunburst at 1,493-1,509 feet and the contact at 1,509-24 feet.

Coolidge & Coolidge No. 3-A State, NW NE NW Sec. 36-36n-2w. Drlg. 225 ft.
G. & A. Oil Co. No. 12 Goeddertz, SE NE SW Sec. 23-35n-3w. Drlg. 1,175 ft.; 8¼-in. at 890 ft.
K. C. Morton No. 1 Osthoff, SW SW SE Sec. 1-35n-3w. T.D. 1,555 ft.; rng. 6⅝-in.
Kippen O. & G. Co. No. 1 Thompson, C NE SE Sec. 28-34n-1e. Spdg.
Sid Porter No. 1 Bradley, SE cor. Sec. 3-34n-2w. T.D. 1,340 ft.; rng. 6⅝-in.; S.O. 1,280-1,340 ft.
C. L. Smith, Agt., No. 1 Govt., SW SE NW Sec. 13-35n-2w. S.D. 1,045 ft.
Aspen O. & R. Co. No. 1 Govt., C NE SE Sec. 25-36n-3w. S.D. 2,050 ft.
Chas. Grant et al No. 1 Anderson, SE NE NE Sec. 26-35n-4w. S.D. 2,109 ft.

Yellowstone County

Riverton Oil Co. No. 1 Fox, CEL NW NE Sec. 14-2n-23e. T.D. 1,990 ft.; rng. 6⅝-in.

UTAH

Cane Creek Oil Co. No. 1 Govt., NW SW Sec. 31-26n-21e. Drlg. 2,538 ft.; out of salt at 2,530 ft.; S.O.&G.
Crescent Eagle Oil Co. No. 1 Brendel, SW SE Sec. 4-22s-19e. Drlg. 4,110 ft.

Summit County

Longwell Pet. Co. No. 1, SE SW SE Sec. 35-3n-5e. T.D. 2,876 ft.; sdtrkg.

Illinois Fields

(Continued from Page 75)

SW cor. SE NE NE Section 21-8s-8e, Menard at 1,940 feet, underreaming 8-inch casing to 1,985 feet. J. Garfield Buell No. 1 Sutton, C S half NW NW Section 5-8s-10e, moving in standard tools. Coates and others No. 1 Green, SW cor. Section 16-9s-9e, shut down at 1,790 feet for repairs.

In Massac County, Marshall Drilling Co. No. 1 McGee, NE NE NE Section 3-16s-5e, spudded and shut down.

In Marion County, Chicago Syndicate No. 1 Williams, NW NE SE Section 36-1n-2e, McClosky pay at 2,438-48 feet tested salt water, plugged back to 2,409 feet to test Rosecliare pay at 2,395-2,405 feet, set 5½-inch casing at 2,390 feet. Menhall No. 1 I. C. R. R., SW NE NW Section 8-2n-1e, drilling at 2,160 feet. There was no McClosky lime. This is a Devonian (Niagaran) lime test. Graves and others No. 1 Marion County Coal Co., SW SW SW Section 29-2n-1e, set 10¾-inch casing at 80 feet. F. D. Strickler No. 1 Holsapple, SE cor. NE NE SE Section 25-2n-1e, Fredonia lime top at 2,130 feet, shut down at 2,168 feet with no showing of oil. John Q. Gill No. 1 J. A. Broom, SW SW SW Section 5-3n-3e, drilling at 2,016 feet. Glen Dean was topped at 1,880 feet.

In Richland County, Pyramid Petroleum Co. No. 1 Hauser, C S half SE SW Section 15-4n-10e, swabbed 1,000 bbls. of oil and some rotary mud in 72 hours, then pumped 208 bbls. in a 24-hour test, not completed.

In Bond County, Joe Kesl and others No. 1 Sibert Meyer, NW NE NW Section 13-4n-2w, drilling at 1,260 feet with the hole caving. Lindsey Bros. No. 1 Butler, NE NE SW Section 31-4n-2w, St. Louis at 1,345 feet, drilling at 1,872 feet.

In Tazewell County, Hopedale Oil & Gas Co. No. 1 Titwiler, NW SW SW Section 2-22n-3w, corrected location, shut down at 2,310 feet.

In Clay County, Pure Oil Co. No. 1 Roy E. Gill, C W half NE NE Section 21-2n-8e, total depth 3,050 feet set 5½-inch casing at 2,973 feet and was swabbing. It had showings in cores from 3,009 to 3,033 feet. Schlafly Dameron No. 4 Nash, NW NW NE Section 13-3n-6e, total depth 2,976 feet, rigging up standard tools. F. Kroeger No. 1 Chaney, NW NW SW Section 18-3n-7e, shut down at 2,535 feet.

In Clinton County, Noelkemper & Murphy No. 1 Kile, SE cor. NE Section 11-3n-3w, shut down 535 feet to make repairs. Adams Oil & Gas Co. No. 1 Hoffman Heirs, NW SE SW Section 26-2n-1w, drilling at 995 feet. Flannery and others No. 1 Charles Gerdes, NW NW SE Section 3-2n-2w, shut down at 900 feet.

In Jasper County, National Consumers Oil Co. No. 1 A. Leamon, NW cor. SE SW Section 4-8n-14w of second principal meridian, drilling at about 1,000 feet.

In Wayne County, Thompson Drilling Co. No. 1 Briscoe, C W half SW NW Section 21-2n-7e, drilling at 2,260 feet.

In Wabash County, Taylor Drilling Co. No. 1 Schafer, SW SW SE Section 28-1n-12w, of the second principal meridian, drilling at 1,260 feet.

CENTRAL OHIO

FINDLAY, Ohio, Feb. 6.—Central Ohio yielded 13 completions, 8 gas wells, 1 oil well, and 4 dry holes.

In Athens County, Lodi Township, Section 11, A. D. Townsend No. 6 Jacob Niggemeyer is a gas well with 125,000 cu. ft. open flow from the second Berea sand at 1,691-93 feet. In Rome Township, Gibson & Ross No. 2 N. E. Dodds, Section 35, gauged 250,000 cu. ft. of gas from the Salt sand at 914-29 feet.

In Guernsey County, Millwood Township, Ohio Fuel Gas Co. No. 1 James Borton, Section 22, had an open flow of 150,000 cu. ft. of gas from Berea sand at 1,493-1,502 feet.

In Licking County, Hanover Township, E. J. Edmond No. 1 Mary G. Davis, Section 17, was dry; total depth 593 feet. In Mary Ann Township, George Vandergrift No. 2 John Hughes, Lot 2, fourth quarter, made 12 bbls. of oil the first 24 hours after a shot at 780-91

(Continued on Page 100)

Sand and sediment hold back the oil — clean them out quickly at small cost with the MILLER, *the Sand Pump in World-Wide use.*

The MILLER is made in diameters of 2½, 3, 3½, 4, 4½, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type. ¼-inch wall tubes in HEAVY Type Sand Pumps.

INTERCHANGEABLE BOTTOMS
To Meet Every Condition

- **BAILER BOTTOM** — With the Bailer Bottom installed the MILLER is quickly changed to a Bailer giving you a combination of either Bailer or a Sand Pump in one tool.
- **SAND BOTTOM** — Used when tools are run and when well is shot to quickly remove loose material.
- **STAR BOTTOM** — Used for cutting the sand loose.
- **CHISEL BOTTOM (In Pump)** — With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.

Write for Descriptive Folder and Price List

See Pages 1564-65 COMPOSITE CATALOG

MILLER Sand Pump Co. — ALSO DRILLING EQUIPMENT CATALOG

General Offices and Factory
OKLAHOMA CITY, OKLAHOMA
1524 S. E. 29th — P. O. BOX 4516 — Tel. 7-6884
Branches SAPULPA, OKLA. Tel. 341 — KILGORE, TEX. Tel. 545 — HOUSTON, TEX. Tel. PRESTON 2341

PATENTED NO. 1370340 NO. 1523606 NO. 1787360 NO. 1902020 NO. 1966025 NO. 2059467

FOR SALE BY ALL SUPPLY STORES

If you haven't had that FREE list of important oil books, by all means send your request to the Book Department, The Oil and Gas Journal, Tulsa, Oklahoma.

Oklahoma Operations

By
DAL DALRYMPLE

New Kingfisher County Test; Wildcat Near Newalla Starts

The 1939 wildcat campaign in Oklahoma continued to gain momentum the past week, with some new tests started in outlying areas and others proposed as operators completed lease blocks and negotiated drilling deals. In the proven areas the Ramsey pool in Payne County held principal interest as extension of the productive limits to the east appeared imminent.

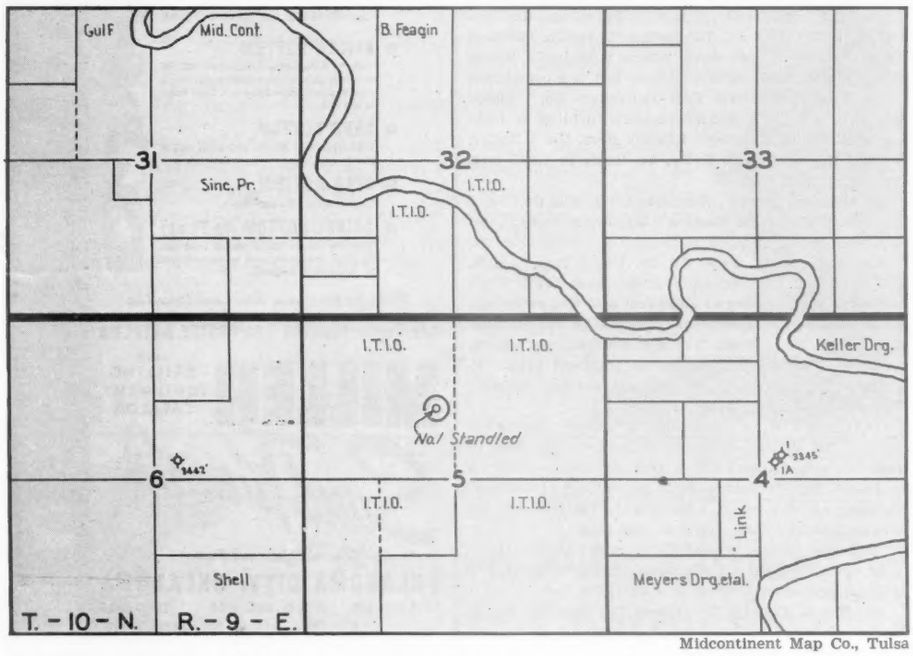
Kingfisher County, which has proven attractive to lease buyers and wildcatters in recent months, provided the locale for one of the new wildcats. It was Kenneth Ellison and others No. 1 Baker, NE NE SW Section 20-19-5w, east of Hennessey in the northeastern part of the county. Location is on a block of 7,000 acres, of which the operators own about 2,100 acres and major companies the remainder. The wildcat is on an old surface structure, and the area has been shot by seismograph by major companies. Johnson & Kemnitz have the contract to drill to 7,500 feet or Wilcox sand. Pits and cellar were being dug. Southwest of the Ellison wildcat and northeast of the town of Kingfisher, Trigg, Garr & Gutowsky No. 1 Lankard, NE NE SE Section 34-17-6w, the only other active wildcat in the county, was drilling below 5,500 feet. A third Kingfisher County wildcat, Hollenbach and others No. 1 Zerger, C SE SW Section 5-18-6w, was shut down at 3,550 feet, and reported temporarily abandoned. J. O. Lewis has assembled a lease block between the Ellison and Trigg-Garr-Gutowsky blocks and is expected to start a test on it later in the year.

The Newalla area in Oklahoma County is to be given another test. R. Olsen Oil Co. of Oklahoma City has contracted with Halco-Meyers Drilling Co. for a 6,600-foot or second Wilcox sand test at No. 1 White, C NE NE Section 30-11-1e. It is one 40-acre location south of Springrose Drilling Co. and others No. 1 Edwards, which had a junked hole and was abandoned several years ago, although it had a good showing of oil. The No. 1 Edwards was dry at 6,540 feet in Wilcox sand but had oil showing in upper zones, supposedly Hunton or Viola lime. Wildcat failures also have been drilled in Section 17-11-1e and Section 15-11-1e.

It is reported that wildcats are being planned on lease blocks in Kiowa County, the blocks being largely in Townships 4n-18w, 5n-17w, 5n-18w, 6n-18w and 7n-14w. A deep wildcat also is proposed on a block around Section 13-18-17w and Section 18-18-16w, south of Taloga in Dewey County, although an official announcement has not been made.

Sinclair Prairie Oil Co. was reported starting work at No. 2 Stockton, 330 feet from the north and east lines of SW Section 26-6s-2w, north of the discovery well in the Oswalt-Stockton area, Love County. Contract depth is 9,000 feet. The discovery well in SE SE SW Section 26-6s-2w, bottomed at 8,785 feet and plugged back to 6,930 feet, is averaging around 30 bbls. of oil daily.

It appeared probable that the Ramsey pool in Payne County would be extended eastward this week. Stanolind Oil & Gas Co. No. 1 Walters, SW SW NE Section 18-18-2e, east of production and outside the community block on which all Ramsey producers are located, was bottomed at 4,823 feet in saturated Wilcox sand and was running casing. Pay was topped at 4,809 feet and saturation was found in a core at 4,817 feet to total depth. Three drilling wells on the community block were nearing decisive depths.



Midcontinent Map Co., Tulsa

A 10-acre spacing order has been issued for the area around Section 5-10-9, where Indian Territory Illuminating Oil Co. has started a wildcat. It is north of the Olympic pool in Okfuskee County

Wildcat Activity

Bridwell Oil Co. No. 1-I Seay, SE NE SW Section 29-6s-5w, opened a producing area in Jefferson County, east of the Spring pool and northwest of the Oscar area. It may be an extension or connecting link between the two pools. Sand was found at 1,515-19 feet, total depth, and it pumped 15 bbls. of oil, with 100 bbls. of water, in 24 hours.

J. L. Casey No. 1 Pace, SW SW NE Section 14-2n-7, wildcat in the Fitts district, Pontotoc County, had a hole full of water and was abandoned at 1,614 feet, total depth.

R. E. Pitts No. 1 Billington, NW NW SE Section 8-7-5, wildcat on the northeast edge of the St. Louis district, Pottawatomie County, was a location.

Estimated Daily Production

Estimated daily production for Oklahoma for the week ending February 4, and for the preceding week, was as follows:

	Barrels	
	Jan. 28	Feb. 4
Allen	5,975	6,100
Billings	4,975	4,900
Burbank	7,325	7,450
South Burbank	9,300	9,225
Balance Osage	17,500	16,600
Blackwell district	3,825	3,875
Bristow-Slick	6,925	6,975
Chandler	1,750	1,775
Crescent	3,325	3,525
Cromwell	3,075	3,025
Cushing-Shamrock	10,300	10,350
Duncan district	4,225	4,200
Edmond	4,500	5,050
Fish	2,600	2,625
Fitts	32,775	32,550
Jesse	2,625	3,025
Graham-Fox	4,225	4,175
Gray	825	850
Healdton	8,675	8,950
Hewitt	3,450	3,500
Keokuk	3,775	3,825
Konawa	1,250	1,225
Lucien	7,900	8,100
Moore	4,225	4,050
Oklahoma City	90,925	99,875
Olympic	3,100	3,125
Ramsey	2,600	2,550
Sasakwa	1,250	1,275
Sholem-Alechem	2,350	2,325
Seminole district:		
Bowlegs	7,675	7,750
Carr City	2,875	2,950
Dora	4,650	4,750
Earlsboro	4,625	4,550
South Earlsboro	550	575
East Earlsboro	3,925	3,950
Little River	6,675	6,750
East Little River	650	700
Maud	1,050	1,025
Mission	1,350	1,375
Seminole	7,375	7,450
East Seminole	1,525	1,500
Searight	2,300	2,325
Total Seminole	45,225	45,650
St. Louis-Pearson	25,650	25,250
Tatums	1,875	1,850
Tonkawa-Garber-Thomas	4,125	4,150
Wewoka	2,150	2,175
Yale-Jennings	3,675	3,725
Other pools	83,750	83,000
Total Oklahoma	422,000	430,875

Pottawatomie County

J. E. Trigg No. 1-A Rhodd, SE cor. Section 32-7-5, St. Louis field, Pottawatomie County, found dolomite at 4,182 feet, was bottomed at 4,211 feet, acidized with 3,000 gallons and pumped 110 bbls. of oil daily.

Mid-Continent Petroleum Corp. No. 1 Vieux, SW SW SE Section 31-7-5, pumped 26 bbls. of oil in 24 hours and was completed at 4,170 feet, total depth.

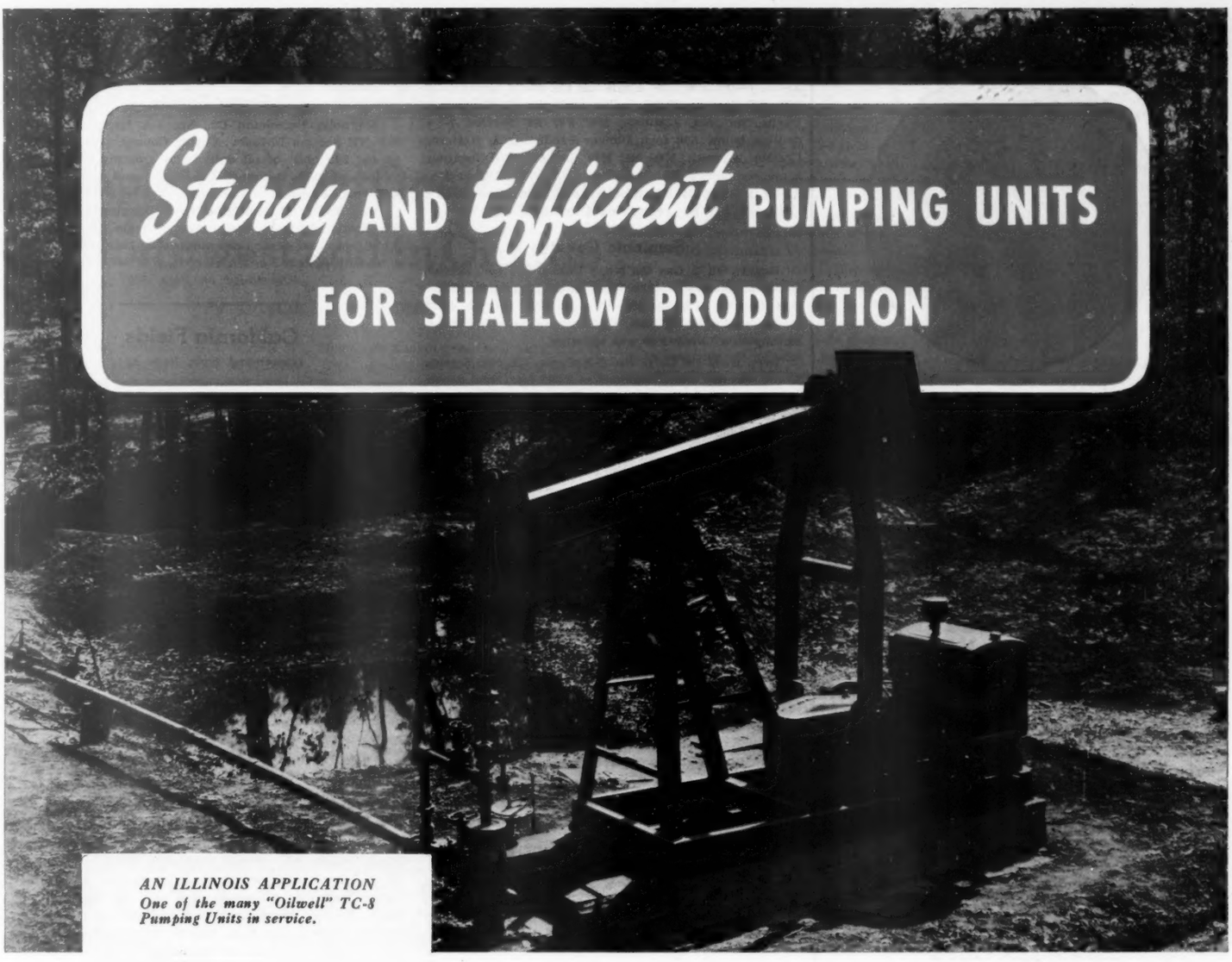
Sinclair Prairie Oil Co. No. 8 Lester, SW SW NE Section 19-6-4, topped Viola lime at 3,636 feet, total depth 4,050 feet, plugged back to 3,704 feet and was completed as a 2-bbl. pumper.

Denver Producing & Refining Co. No. 1 Richards, SW NE NE Section 2-6-4, an old well bottomed at 4,092 feet, was deepened to 4,117 feet, acidized with 3,500 gallons, pumped 260 bbls. of 40-gravity oil and 2,000 bbls. of water and was recompleted.

F. W. Cooper No. 1 Bewley, SW SE NW Section 36-7-4, an old well, was deepened from 4,180 feet to 4,232 feet, and recompleted for 962 bbls. of oil in 24 hours.

New activity in Pottawatomie County: Big Chief

Sturdy AND *Efficient* PUMPING UNITS FOR SHALLOW PRODUCTION



AN ILLINOIS APPLICATION
One of the many "Oilwell" TC-8 Pumping Units in service.

UNIT	TC-5	TC-8
Polished Rod Capacity . . . (lbs.)	5000	8000
Peak Torque Capacity . (in.-lbs.)	22,500	38,600
Over-all Gear Ratio	32 : 1	42.15 : 1
Maximum Stroke . . . . . .(in.)	24	30

THE new "Oilwell" TC-5 and TC-8 Twin-Crank Pumping Units give efficient and trouble-free performance, like big "Oilwell" Units, at very low installed-cost. Here are a few of their features:

1. Extreme simplicity.
2. Four-leg, derrick-type samson post welded to rigid, widespread, portable steel base.
3. Double-reduction speed reducer with single-helical gearing and tapered roller bearings.
4. Oilbath, bronze-bushed saddle and upper pitman bearings; self-aligning roller bearings on crank pins.
5. High over-all gear ratio facilitates use of inexpensive, high-speed prime mover.
6. Universal slide rails provide convenient mounting for various prime movers.

Ask for complete specifications.

OIL WELL SUPPLY COMPANY

Branch Stores in All Oil Fields

Subsidiary of United States Steel Corporation

"OILWELL"

Now it's easy to select the right valve cup!

Here it is — **The Darcova Cup Selector!**

Operators, store men, warehousemen and engineers will welcome this ingenious device. The Darcova Cup Selector includes in small space all the information for which you previously had to look in complicated charts.

The various sizes of cups are listed consecutively around the outside of the center dial, and the names of the manufacturers and trade names of the pumps are listed in the lower panel on the face of the selector.

To determine the size of the cup for use in any pump it is merely necessary to set the size and name of the pump opposite the manufacturer's name in the lower window and read the proper size of cup in the upper window.

In order to obtain the proper pump on which any size cup may be used, the size of the cup is set in the upper window and the name and size of the pump is read opposite the manufacturer's or pump name in the lower window.

This size and design of the selector permits desk use or filing. Or, the Selector may be hung in any convenient location, making the desired information readily accessible.

It pays to select DARCOVA, DARVAL and DARFLEX CUPS

Made by the makers of the original composition valve cups

DARLING VALVE & MFG. CO.
WILLIAMSPORT, PENNSYLVANIA

Drilling Co. No. 3 Canfield, NE SW SW Section 33-7-5, spudded; J. F. Smith No. 3 Tarter, NW SW SW Section 32-7-5, cellar and pits; Eagle Oil Co. No. 1 Green, NW NW SE Section 29-7-5, cellar and pits; Helmerich & Payne, Inc. No. 3 Wilsie, NW SW SE Section 7-7-4, drilling below 593 feet; Denver Producing & Refining Co. No. 2 Smith, NW NE NW Section 6-6-5, location; same company's No. 1 Atchely, NW SW NW Section 6-6-5, drilling; Mid-Continent Petroleum Corp. No. 1 Cecil, SW SW NE Section 6-6-4, building rig.

Seminole County

Rogers Oil & Gas Co. No. 1 Oakes, SW cor. Section 16-7-6, an old well in the West Little River pool, Seminole County, was deepened from 4,447 feet to 4,433 feet, and pumped 289 bbls. of 37.5-gravity oil in 24 hours, recompleted. No water was showing.

Deep Rock Oil Corp. No. 2 McCann, NE cor. Section 33-7-6, was dry and abandoned at 2,285 feet, total depth.

Gulf Oil Corp. No. 4 Grayson, SW NW SW NW Section 13-6-5, plugged back from total depth of 2,701 feet to 2,690 feet and was abandoned.

W. C. McBride No. 1-B Gaines, SW NE SW SW Section 20-6-7, was reported abandoned at 1,873 feet. total depth.

Commercial Drilling Co. No. 1 Billington, NE NE SW Section 28-7-6, Dora area, was a location. Francis Oil & Gas Co. No. 3 Harris, SE NW NW Section 4-6-6, was building rig. Woodson Co. No. 1 Goodrich, NE SW SE Section 14-5-5, wildcat in southwestern Seminole County, was a location.

Pontotoc-Coal Counties

Konawa Development Co. No. 1 Masters, SW cor. Section 14-2n-7, Pontotoc County, was bottomed at 1,405 feet, shot with 50 quarts, and was completed for 100 bbls. of oil in 24 hours.

Deep Rock Oil Corp. No. 1-A Bates, SW SW NW Section 36-5-7, Pontotoc County, was completed for 34 bbls. of oil daily at 2,500 feet, total depth.

Continental Oil Co. No. 3 Brown, NE SW SW Section 7-1n-8, Coal County sector of the Jesse pool, had dug cellar.

Okfuskee-Okmulgee Counties

Eldridge No. 1 White, C NE NE Section 31-11-11, Okfuskee County, was an abandoned location.

Staples No. 2 Robinson, SW SW SE SE Section 21-12-11, Okfuskee County, was dry and abandoned at 2,275 feet, total depth.

Conrad Lambert No. 1-A Barber, CSL NE NE NW Section 29-15-14, Okmulgee County, total depth 2,288 feet, was dry and abandoned.

Francis Corp. No. 3-A Lemons, NW cor. Section 33-15-14, Okmulgee County, was moving in machine. In the same county, Stekol No. 1-A Buck, CSL NE NE Section 23-16-12, had rigged up machine.

Creek-Muskogee Counties

McAdams & Thornton No. 1 Fast, SE SE NE Section 36-17-9, Creek County, topped Dutcher sand at 2,710 feet, was bottomed at 2,712 feet and produced 600 bbls. of oil in 24 hours.

Strozier Drilling Co. No. 3 McDougal, SE SE NW Section 12-16-11, was bottomed at 2,394 feet, plugged back to 1,125 feet, shot and produced 330,000 cu. ft. of gas daily.

Dixie Oil & Gas Co. No. 1 Lumm, SW NE Section 8-14-8, was reported abandoned at 1,130 feet, total depth.

Anderson and others No. 1 Conrad, C NE SW Section 32-14-8, was dry and abandoned at 2,530 feet, total depth.

Burke-Greis Oil Co. No. 1 McMechan, SW NW NW Section 7-18-9, was bottomed at 2,235 feet and dry and abandoned.

R. L. Hallifield No. 1-A Henson, CSL NE NE Section 19-14-19, Muskogee County, was drilling below 210 feet.

Payne-Logan-Pawnee Counties

Helmerich & Payne, Inc., No. 1 Strain, NW NW SE Section 27-16-1e, Logan County, was bottomed at 6,920 feet, plugged back to 4,950 feet without developing production and was abandoned.

Coronado Oil Co. No. 20 Schooland, SW NW SW Section 16-21-8, Pawnee County, was deepened from 1,835 feet to 2,228 feet, total depth, and pumped 8 bbls. of oil daily.

Gulf Oil Corp. No. 3 George, SW NW NW Section 4-19-5, Payne County, found Bartlesville sand at 3,168 feet, total depth 3,230 feet, was shot with 80 quarts and completed for 70 bbls. of oil daily.

Carter County

Magnolia Petroleum Co. No. 1-A Heffner-Mills, C SW NE Section 27-2s-3w, Carter County, was completed for 249 bbls. of oil daily after treating with 5,000 gallons of acid. It topped Oil Creek sand at 7,932 feet and was bottomed at 7,996 feet.

Roy Kyle and associates No. 2 Daugherty, SW NE SW Section 17-4s-2w, was deepened from 2,070 feet to 3,154 feet, total depth, and pumped 50 bbls. of oil daily.

C. Dillingham No. 1-A Harrell, NW NW NE Section

(Continued on Page 100)

California Fields

(Continued from Page 82)

from the O'Dea zone with bottom of the hole at 7,760 feet. This new well which was brought in through a 28/64-inch bean was carried down to 7,845 feet but ran into bottom water which forced the company to put a cement plug in the bottom of the hole. Wilshire Oil Co. hopes to clear up some final details within the next few weeks in order to be in a position to begin drilling operations on No. 1 Leitch. This well has been hung up with zoning trouble but the necessary permit should be forthcoming in the near future. Superior Oil Co. is having considerable trouble with No. 12 Maxwell Community in the southern end of the Rosecrans field as it does not seem to have sufficient kick to result in a natural flow. This well, which showed a potentiality of 800 bbls. per day from the O'Dea zone during the course of work, was carried down to 8,852 feet in search of a deeper horizon but has since been plugged back to 7,696 feet. It has been swabbing mud and water for the past week or 10 days indicating the possibility that the productive measure may perhaps have been mudded off. The O'Dea zone in this field has proved to be larger in areal extent than was originally expected with the result that some properties around the edge of the field which appeared to be of questionable value from a production standpoint during the early stages of deep zone exploitation have since been found to be highly productive. Either Barnsdall Oil Co. or Union Oil Co. could have tied up these properties before the former began deep zone development but both passed them up as of doubtful value. Subsequently Barnsdall Oil Co. made a deal with Exeter Oil Co. whereby the former drilled a well on the latter's lease and after securing return of invested capital both will participate equally. This deal contemplated the drilling of two or three additional wells but up to the present no further activity has been evident.

San Joaquin Valley

In the Canal field of Kern County, Standard Oil Co. has completed No. 1 Rio Bravo fee flowing 416 bbls. of relatively clean 37.2-gravity oil and 500,000 feet of natural gas per day from the Stevens zone with bottom of the hole at 8,280 feet. This new well, which was brought in flowing through a 35/64-inch bean, was finished with a 6⅝-inch water string landed at 8,210 feet and 117 feet of 5-inch liner including 40 feet of perforated landed at 8,279 feet and 8,253 feet of 2½-inch tubing. The small amount of oil zone present and the small amount of production secured tends to indicate that this well is located very close to the northern limits of production. No. 1 Rio Bravo fee was drilled on property purchased by Standard Oil Co. a number of years ago upon which to erect a pump station. Western Gulf Oil Co. has leased approximately 1,700 acres of potential oil land about 2 miles east of production in the Buena Vista Lake district of Kern County and early work is expected. Location of the first test will be due east of several gas wells drilled by Ohio Oil Co. in the Buena Vista Lake gas field. In the Greeley field of Kern County, Standard Oil Co. is drilling ahead in No. 1 Elrich in Section 20-29-26 at 11,430 feet with the Rio Bravo zone as the well's objective. This horizon has not yet been logged but is expected to be picked up within the next 250 feet if correlations have been correct. In the Round Mountain field, Shell Oil Co. has completed No. 21 Freeman in Section 20-28-29 but the well was only good for 52 bbls. of 22.6-gravity oil cutting 57 per cent from 1,915 feet. The large cut indicates a possibility that some additional remedial work will be undertaken in the near future unless the output cleans up in the meantime.

Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ontario, Feb. 4.—Crude oil and naphtha production from all Alberta fields in December totaled 472,774 bbls. compared with 427,236 bbls. in November. Turner Valley limestone oil wells increased from 384,551 to 421,209 bbls., and Turner Valley gas wells from 37,142 to 46,761 bbls. Turner Valley shallow crude was up from 778 to 836 bbls. and Red Coulee light crude from 1,098 to 1,177 bbls. Wainwright heavy crude declined from 1,043 to 1,025 bbls.; Dina-Ribstone heavy crude from 1,280 to 640 bbls., and Taber crude from 1,344 to 328 bbls. The Moose dome well, which reported no production for November, delivered 798 bbls. in December.

In Turner Valley, Royalite Oil Co. was again the leading producer with 71,932 bbls. of crude and 27,579 bbls. of naphtha, all from the limestone. This included absorption gasoline. Among leading crude producers, West Turner Petroleums, with three wells, yielded 24,488 bbls. and Davies Petroleums, with three wells, 23,733 bbls. Brown Oil Corp. with four wells delivered 23,092 bbls.; Royal Canadian Oils, two wells, 22,935 bbls. and Sunset Oils, two wells, 22,110 bbls. Among the largest individual producers were York Oils No. 1, 12,523 bbls.; Sundance Royalties No. 1, 12,420 bbls.; Frontier Royalties No. 1, 11,914 bbls.; Vulcan-Brown Petroleums No. 1, 11,346 bbls. and Consolidated Royalties No. 1, 10,234 bbls.

Among new producers, Anglo-Canadian No. 1, LSD 16, Section 31-18-2w5, the outlying producer on the west, yielded 8,504 bbls.; and Producers Crude Corp. No. 1, LSD 11, Section 20-18-2w5, starting late in December, gave 3,125 bbls. Turner Valley Royalties No. 1, the first west flank crude well, producing continuously since June, 1936, yielded 4,268 bbls.

The December figures bring the Alberta production for the year to 6,742,039 bbls., against 2,796,908 bbls. in 1937; the 1938 figure representing a daily average around 18,470 bbls. Since oil production started in 1914, Alberta has produced 20,514,241 bbls., of which over 90 per cent came from Turner Valley. About half this production has been secured since the completion of Turner Valley Royalties No. 1 in June, 1936.

A new Alberta Conservation Board order, effective January 31, restricted Turner Valley crude production to between 10,000 and 10,500 bbls. a day. The cut is stated to be temporary, designed to reduce a stored surplus in the field and at Calgary of about 300,000 bbls. built up in recent weeks by completion of new wells. The previous allowable of 12,500 bbls. was designed to meet market demands, but new completions brought actual daily production to around 14,300 bbls. It is expected the 12,500 bbls. quota will be restored in about a month, and later gradually increased to meet spring and summer seasonal demands.

New conservation board tests recently completed were made with 1-inch instead of 2-inch choke, and showed an aggregate potential of 53,768 bbls. a day, about 80 per cent of the potential indicated in tests with 1-inch choke last fall and official tests of completions since then. Despite the smaller choke, a number of wells show substantial increases, though the majority show declines. In the majority of cases bottom-hole pressures are greater, and the gas-oil ratios are less; each of these factors having a 25 per cent bearing on allowables.

The tests indicated Vulcan Brown Petroleums No. 1, LSD 10, Section 5-19-2w5 had a potential of 2,391 bbls., the largest in the field, Home Oil Co. No. 2 Millarville, LSD 6, Section 33-20-3w5 ranking second with 2,377 bbls. An incomplete list of new allowables shows the following larger wells in bbls. per day:

Royal Canadian No. 2	302
Vulcan-Brown No. 1	285
Extension Royalties No. 1	277
Home-Millarville No. 2	276
Sundance Royalties No. 1	262
Sunset Oils No. 1	258
Frontier Royalties No. 1	256
Royalite No. 30	254
Prairie Royalties No. 1	235

Official figures of January 28 showed: Gas wells, 104; crude producers, 68; testing, 2; drilling, 17; resuming, 3; standing, 8; ready to spud, 9; total wells, 211.

New Gas Restrictions

Under a new order of the Conservation Board, the aggregate allowable of 104 gas wells in Turner Valley will be restricted to approximately 65,000,000 cu. ft. a day, from the previous flow of 108,000,000 cu. ft. The latter was designed to meet the requirements of gasoline absorption plants in addition to market requirements of the Canadian Western Natural Gas Co. system and other users. The new restrictions will limit the flow to market requirements plus a small allowable for absorption plants; and will result in the shutting off of waste gas flares of naphtha wells, flares being allowed only in the case of crude wells where the gas is necessary to lift the oil. The waste of gas from crude wells will be further restricted as soon as a repressuring scheme can be worked out.

Utilization of Turner Valley gas for repressuring the Bow Island field was also halted by the Conservation Board effective February 1. Since repressuring operations were started in August, 1930, the Canadian Western Natural Gas Co. has stored approximately 11,500,000,000 cu. ft. of Turner Valley residual gas in the Bow Island sands, bringing up the pressure from 248 pounds in 1930 to 542 pounds at the end of 1937, and providing an important emergency gas reserve for Calgary and other communities on the Canadian Western system. The Conservation Board takes the view that maintenance of pressure in the Turner Valley field is necessary for efficient produc-

(Continued on Page 106)

PROVES BEST

—or Costs You NOTHING!

"The Entirely Different Boiler and Engine Treatment"

Try Sand-Banum for 30, 60 or 90 days. If at the end of that period you are not entirely satisfied with results, or you find it does not do everything we say it will, you pay us nothing and you owe us nothing!

If you are really interested in the most efficient way to control scale and corrosion in boilers and engines try Sand-Banum on this fair offer. This pure colloidal concentrate *speaks for itself;* you prove its value in *your own equipment* before you buy it!

Compare its simplicity with all other methods: Comes ready for use in 16-oz. cans; yet one can will protect a 250 Hp. boiler for a month! Ounces are used instead of hundreds of pounds of "chemicals" and it is always safe. Regardless of the operating conditions or the nature of the water used scale or corrosion cannot form or remain in its presence!

Write us today for a test and prove "The Best"!

AMERICAN SAND-BANUM COMPANY, Inc.

9 ROCKEFELLER PLAZA NEW YORK CITY

Renew Your Subscription *Now*

William M. Barret, Inc.

Consulting Geophysicists

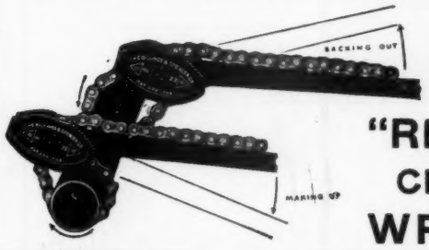
Specializing in Magnetic Surveys

Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique.

GIDDENS-LANE BUILDING -:- SHREVEPORT, LA.

BILLINGS

THE BILLINGS & SPENCER CO. HARTFORD, CONNECTICUT, U. S. A.



Reversible!

"RED HEAD" CHAIN PIPE WRENCHES

BILLINGS CHAINS

Separate chains (complete) are packed in sturdy boxes plainly marked, designating the wrenches with which they are used.

Turns pipe instantly in either direction without removing wrench—a Billings feature. The double jaws, when worn, are easily removed and reversed—doubling wrench life. Standard single nut and bolt assembly can be replaced from local stores.

Oil Workers know the "Red Head" to be a brute for taking punishment and it's Safe.

The "Red Head" is made in Double and Single Jaw, also Back-up and Break-out. The "Gardnerench" for narrow beads on fittings and flanges, and the Billings Improved Chain Pipe Vise are all well known to Oil Field Workers for their strength, safety and rapidity in use.

USED AS A FITTINGS WRENCH

By removing the outer jaws on the "Red Head" Reversible, it makes a strong Fittings Wrench for Narrow Beads on Fittings and Flanges.

ASK YOUR DISTRIBUTORS SALESMAN

FORGED TOOLS

COMMERCIAL DROP FORGINGS · BOARD DROP HAMMERS and DIE MAKING MACHINERY

Kansas Developments

By
DAL DALRYMPLE

Two Forest City Basin Tests Started in Northeast Kansas

Drilling for oil has started in the Forest City Basin, scene of an intensive lease play that has spread into many counties in Kansas, Missouri, Iowa and Nebraska. Much has been written in recent months about the geology and lease activity in the basin, but until the past week there has been little news regarding actual field operations.

That lack of development news was remedied the past week when John Hardaway and associates started work at No. 1 Scheller, SW SE SW Section 30-10-22e, Leavenworth County, in the Kansas sector of the basin. Ten-inch casing was set at 44 feet and the crew was drilling below 225 feet. Location is 18 miles west of Kansas City and 12 miles southwest of Leavenworth It is 6 miles west of the Bonner Springs-Bethel gas pool and 6 miles north of the Linwood gas pool.

W. M. McKnabb is reported to have spudded at No. 1 Fritz, SW SE NW Section 4-12-14e, wildcat 12 miles west of Topeka in Shawnee County, a northeastern Kansas test that was announced several weeks ago. Production will be sought in formations between 3,000 and 4,500 feet.

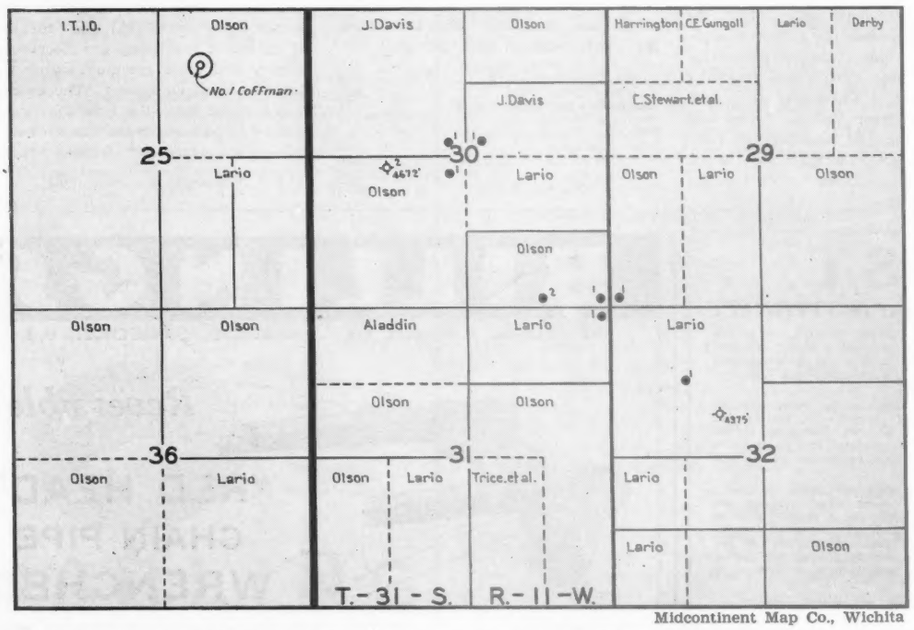
Other tests are expected to be started in the Kansas sector of the basin within the next few weeks, or as soon as lease blocks can be completed, titles cleared and other preliminary details attended to. Leasing, geological and geophysical exploration and, in some areas, core-drilling continues in several northeastern Kansas counties, as well as in neighboring corners of the three adjoining states.

Work is due to start at one or more wildcats in Missouri at an early date. Harve V. Elwell, independent Wichita operator who was among the first to start leasing in Missouri, was reported to have sold a half interest in 21,000 acres he had under lease in Sullivan, Grundy, Mercer and Harrison counties, to the North Missouri Oil Development Co. That company, with headquarters at Trenton, Mo., is expected to drill at least two wells. One of these will be on the S. J. Taylor farm, 5 miles west of Milan, where Mr. Elwell erected a derrick several weeks ago, it is reported. Location for the other test has not been announced.

In the meantime, western Kansas operators continue to open new producing areas or extend proven areas.

Virginia Drilling Co. and S. A. Murphy No. 1 Schloctermeyer, SE SE NW Section 7-21-11w, wildcat 10 miles northeast of Hudson, gave promise of opening a pool in Stafford County. It topped Arbuckle lime at 3,457 feet and recovered saturation in a core at 3,457½ to 3,463 feet, according to reports from the field. Nearest production is in the Snider pool, about 2½ miles northeastward.

Stanolind Oil & Gas Co. No. 3-D Siefkes, SW cor. Section 34-21-12w, more than one-half mile northwest of the discovery well in the South Sittner pool and the second producer in the area, was acidized and made



Midcontinent Map Co., Wichita

Olson Oil Co. has started a wildcat northwest of the Whelan pool in Barber County at No. 1 Coffman in Section 25-31-12w

Landon & Allison No. 1 Shriver, NE NW NE Section 28-27-6, extended the Kramer pool in Butler County three-fourths mile northward. It found Simpson dolomite at 3,083-85 feet, was acidized and pumped 35 bbls. of oil daily.

Wildcat Operations

J. H. Tatlock No. 1 Proffitt, SW SE SW Section 12-20-10w, wildcat 1 mile west of the Chase pool in Rice County, found the pay late in 1938, but was not listed as officially completed until the past week. It found Arbuckle lime at 3,327-35 feet, total depth, pumped 99 bbls. of oil in eight hours and made potential of 298 bbls. of oil with a large amount of water. Lansing lime was found at 3,025 feet, Simpson sand at 3,294 feet.

Cities Service Oil Co. and others No. 1 DeWitt, SE SW NE Section 33-19-9w, wildcat 1 mile south of the Campbell pool and 1¼ miles east of the Chase pool in Rice County, was completed in Arbuckle lime at 3,174-95 feet, total depth. It pumped 513 bbls. of oil in eight hours and made potential of 1,540 bbls. Gravity of the oil was 49.6 degrees. Top of Lansing lime was 2,859 feet, Simpson sand 3,170 feet. The new area probably will be classed as an extension of the Campbell pool.

Producers Oil Co. No. 1 Ham, SW SW NW Section 25-7-19w, an old wildcat in Rooks County, was deepened from 1,800 feet to 3,372 feet, total depth, and was dry and abandoned.

C. L. Carlock No. 1 Philip, SE SW NE Section 10-15-17w, Ellis County wildcat, topped Lansing lime at 3,130 feet, Arbuckle lime 3,387 feet, and was dry and abandoned at 3,418 feet, total depth.

H. L. Turner No. 1 Black, SE NE NW Section 3-27-13, wildcat in Greenwood County, found Arbuckle lime at 1,890 feet and was dry and abandoned at 1,895 feet, total depth.

Crabtree & Myers No. 1 Stolting, C NE NE Section 7-1s-15w, wildcat in northwestern Smith County, was rigging up rotary. Location is about 1¼ miles south of the Nebraska line.

Central Petroleum Co. No. 1 Karst, SW NE SW Section 21-15-13w, wildcat east of the Trapp field in southern Russell County, was a cellar.

Estimated Daily Production

Estimated daily production for Kansas for the week ending February 4 and for the preceding week, was as follows:

	Barrels	
	Jan. 28	Feb. 4
Oxford City	950	900
Burrton	8,175	8,050
Ritz-Canton	3,950	3,925
Graber	2,900	2,700
Hollow-Nikkel	1,700	1,675
Lerado	375	650
Voshell	1,875	1,850
Wellington	1,975	2,000
Ellsworth County:		
Lorraine	1,175	1,525
Other pools	1,005	1,290
Rice-Barton counties:		
Bloomer	1,900	1,775
Chase	3,975	4,425
Geneseo	3,650	3,825
Raymond	750	775
Silica	8,150	10,375
South Silica	1,725	2,075
Keesling	950	875
Miscellaneous Rice	8,585	8,530
Miscellaneous Barton	6,560	7,550
Wherry	2,700	2,950
Russell County	20,700	22,050
Sedgwick County	3,300	3,425
Ellis:		
Bemis	3,275	3,850
Miscellaneous	2,940	4,320
Kingman County	650	560
Stafford County	3,140	5,600
Greenwood County	8,925	8,850
Butler County	18,875	19,325
Other fields	15,295	12,875
Total Kansas	140,125	148,575

Barton County

Sinclair Prairie Oil Co. No. 1 Joe Prusa, C S half S half NE Section 20-16-11w, extended the Prusa pool in Barton County one-half mile northwest and was completed in Arbuckle lime at 3,289-3,305 feet, total depth. It pumped 413 bbls. of oil in eight hours and made potential of 1,253 bbls.

Gulf Oil Corp. No. 5 Spanier, C S half N half NW Section 12-20-11w. Silica field, had Arbuckle lime at 3,268-75 feet, total depth, was acidized with 2,000 gallons and pumped 579 bbls. of oil in six hours. It was retreated with 2,000 gallons, pumped 763 bbls. of oil in eight hours and made potential of 2,209 bbls.

Skelly Oil Co. No. 1 Linsner, SW SE SE Section 3-17-13w, Ainsworth area, topped Arbuckle lime at 3,387 feet and was dry and abandoned at 3,418 feet, total depth.

New work in Barton County: Stanolind Oil & Gas Co. No. 12 Kowalsky, C S half N half NE Section 11-20-11w, rigging up rotary; same operator's No. 15 Panning, C S half N half SE Section 2-20-11w, rigging up rotary; Cities Service Oil Co. No. 3-C Bitter, C W half W half NE Section 18-16-13w, building rotary rig; Continental

FOR LOWER DRILLING COSTS

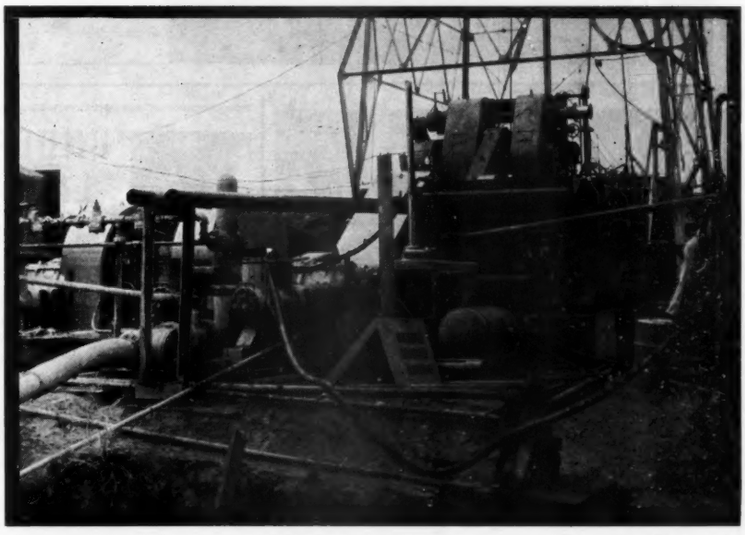
INVESTIGATE IDEAL

"Reg. U. S. Pat. Off."

TYPE "C" POWER DRIVEN SLUSH PUMPS

Ideal Type "C" Power Driven Slush Pumps are not only economical to operate, but they are designed to maintain the high pressure circulation so necessary to the most rapid drilling. Available in four sizes to cover usual range of rotary drilling requirements.

Model No.	Maximum Liner Size	Stroke	Maximum Working Pressure	Pressure Rating of Full Size Liner	Rated Speed	Rated H.P.	Weight Pounds
C-100	6¼"	10	1,500	520	65	100	12,250
C-150	6¾"	12	2,000	550	65	150	17,000
C-250	7¼"	15	2,500	710	60	250	28,975
C-350	7¾"	18	3,000	800	55	350	36,400



NATIONAL

EXECUTIVE OFFICES: PITTSBURGH, PA.
GENERAL SALES OFFICE:
TOLEDO, OHIO

DIVISION OFFICES:
FT. WORTH, TEXAS; TULSA, OKLA.;
TORRANCE, CALIF.

THE NATIONAL SUPPLY COMPANY

Has What It Takes!

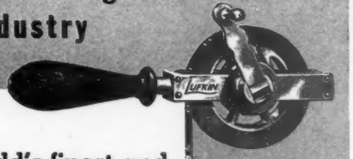
Thicknesses from 1/64" to 1/4". Sheets 40"x 40" and larger.

GARLOCK 7021 Compressed Asbestos Sheet Packing *has what it takes!* Specially developed for severe oil conditions, GARLOCK 7021 gives particularly long, dependable service against light oil at high temperatures. Recommended for cracking stills and other equipment handling gasoline, light oils or steam.

THE GARLOCK PACKING COMPANY
PALMYRA, NEW YORK
TULSA, OKLA. HOUSTON, TEX. LOS ANGELES, CALIF.

Garlock 7021
COMPRESSED ASBESTOS SHEET PACKING

LUFKIN
TAPES - RULES - TOOLS
Most Widely and Favorably Known Throughout the Oil Industry



The World's finest and most complete assortment of Steel Tapes for Tank Gaging, Strapping, Derrick and general measuring.

Also Metallic Woven Tapes, Folding Wood Rules, Aluminum Rules and Precision Tools.

SEND FOR CATALOG NO. 12

See Lufkin Page in the Petroleum Register and the Composite Catalog.

Specify LUFKIN It's your assurance of the best in measuring devices.

THE LUFKIN RULE CO.
SAGINAW, MICHIGAN
106-110 Lafayette St., New York City

UNDERWRITERS' LABORATORIES
Recommend
ECOLITE 50S

Yes, sir—Ecolite 50S is a safe electric lantern to use in the presence of inflammable gases and vapors. It's handy to carry and is specially made for gaugers, pipe men and all other oil men who need a strong, bright spotlight.

Available at Supply Stores

ECONOMY ELECTRIC LANTERN CO., 325 W. Huron St. Chicago, Ill.

WELCOME TO ST. LOUIS
Welcome to friendly service . . . fine food and drink, served in the hospitable atmosphere of
HOTEL Mayfair
8th and ST. CHARLES
DOWNTOWN AT YOUR DOORSTEP
Over 50% of all rooms $3.50 or less single $5.00 or less double

Oil Co. No. 2 Underwood, NE NW NE Section 10-17-13w, building rotary rig.

Stafford County

Continental Oil Co. No. 1 McCune, SW SW NE Section 12-25-13w, Leesburgh field, Stafford County, pumped 674 bbls. of oil in eight hours and made potential of 2,022 bbls. Production was from Arbuckle lime at 4,070-91 feet, total depth. It extends the pool one-fourth mile to the northwest.

E. H. Moore, Inc., No. 9 Johnson, NW NE SE Section 13-24-11w, Zenith pool, found Misener sand at 3,795-3,810 feet, total depth 3,813 feet, flowed 163 bbls. of oil in four hours and made daily potential of 1,614 bbls.

Stanolind Oil & Gas Co. No. 5-B Volker, SW cor. Section 14-24-11w, topped Misener sand at 3,808 feet, was bottomed at 3,817 feet, plugged back to 3,809 feet, pumped 90 bbls. of oil in eight hours and made potential of 271 bbls. of oil daily, with 30 per cent water.

J. E. Crosbie, Inc., No. 1 McNickel, C S half S half SE Section 2-24-11w, topped Misener sand at 3,685 feet, Viola lime 3,698 feet, and was dry and abandoned at 3,718 feet, total depth.

Rice County

J. T. Tatlock No. 2 Bayer A, SW NW NE Section 7-20-10w, Silica field, Rice County, topped Arbuckle lime at 3,119½ feet, was bottomed at 3,325 feet, acidized, pumped 346 bbls. of oil in eight hours and made potential of 1,038 bbls.

Continental Oil Co. No. 2 Siemsen, SW NW NW Section 18-18-7w, Geneseo field, pumped 870 bbls. of oil in eight hours, making daily potential of 2,609 bbls. Production was from Arbuckle lime at 3,204-12 feet, total depth.

Same company's No. 7 Nickel, NE NE SW Section 13-18-8w, found Arbuckle lime at 3,231-34 feet, total depth, pumped 410 bbls. of oil in eight hours and was rated potentially at 1,230 bbls. daily.

Two new operations in Rice County were reported. Continental Oil Co. No. 1-A Siemsen, NW NE SE Section 13-18-8w, was a location. Cities Service Oil Co. No. 1 Pulliam, C N half N half SE Section 33-19-9w, was building rotary rig.

Russell County

Texas Co. No. 1 Boxberger, SE cor. Section 22-14-14w, Gurney pool, Russell County, found Lansing lime at 2,960-3,003 feet, total depth, was acidized with 4,000 gallons, pumped 525 bbls. of oil in eight hours and made potential of 1,575 bbls.

Central Petroleum Co. No. 1 Mills, SW cor. Section 34-13-15w, Gorham pool, pumped 171 bbls. of oil in eight hours from Gorham sand at 3,316-19 feet, total depth, and made potential of 362 bbls.

Cities Service Oil Co. No. 3 Ochs, SW SW NE Section 23-15-14w, Trapp field, was completed in Arbuckle lime at 3,349-58 feet, total depth. It pumped 518 bbls. of oil in eight hours and made potential of 1,553 bbls.

First reports of news activity in Russell County: Saco Oil Co. No. 3 Gurney, SW cor. Section 23-14-14w, location; Continental Oil Co. No. 3 Meharg, NE cor. Section 17-15-13w, building rotary rig; Cities Service Oil Co. No. 1 Redetzke, NE cor. Section 21-15-13w, moving in material; W. I. Southern, Inc., No. 1 Berry, SW NE NW Section 27-15-13w, building rotary rig; Cities Service Oil Co. No. 2 Bender, NW NW SE Section 23-15-14w, cellar.

Pratt County

Skelly Oil Co. No. 1 Miller, NW NE NW Section 36-27-11w, Cunningham area, Pratt County, found Lansing-Kansas City lime at 3,450-3,500 feet, total depth, flowed 97 bbls. of oil and 17 bbls. of water in eight hours and made potential of 293 bbls. Gas gauged 1,100,000 feet of gas daily.

Drillers Gas Co. No. 1 Hoagland, SE NE SE Section 26-27-11w, was a rotary rig.

Cowley County

Smith, Pryor & Lockhart No. 1-A Kingsbury, NW NE NW Section 9-33-6, east offset to the discovery well in the Wilson pool, Cowley County, found Arbuckle lime at 3,510-12 feet, total depth, pumped 138 bbls. of oil and some water in eight hours and made potential of 417 bbls. of oil. It is the second producer to be completed in the area.

Arthur Brewer No. 1 King, NW SW NW Section 27-31-4, was rigging up.

(Continued on Page 104)

North and East Texas

By
D. H. STORMONT

Recently Discovered Pools Are Active; 2 New Wildcats

WICHITA FALLS, Tex., Feb. 6.—Staking of two wildcat tests in the 4,300-foot area of Archer County, and increased activity in Montague and Baylor counties' new pools featured the development in the North Texas district.

Two new wildcat tests will seek the 4,300-foot pay of northern Archer County, producing in the Hull-Silk pool and the new Sikes pool about 4 miles northeast of the former. E. P. Griffin, Wichita Falls operator in the K.M.A. pool, is drilling both of the tests. Griffin staked No. 1 W. T. Waggoner Estate in the southeast corner of Section 3, Block 4, H.&T.C. Survey, about 1 mile south of the Diversion Lake dam in the northwestern part of the county. The other test is in the extreme northern part of the Hull-Silk pool, and is the operator's No. 1 L. F. Wilson, in the southeast corner of Lot 2, Block 128, A.T.N.C.L. Survey. This test is about three-fourths of a mile north of the Mazda Oil Co. No. 1 Finley, completed in the 4,300-foot section for 106 bbls. of oil in three hours.

Montague County's two new oil pools showed signs of immediate development as Rogers & Rogers, who discovered the pool just outside of the town of Nocona, farmed out a tract of 150 acres from the Texas Co. for the drilling of an offset to the discovery well. The Texas Co. retained a one-sixth over-riding interest in the lease and Rogers & Rogers agreed to drill all offset locations as they became necessary.

Two and one-half miles northeast of Bonita in the northeastern part of Montague County, where Benton & Holmes brought in the second new pool, United Producers and Continental Oil No. 1 Langford, south offset to the discovery well, was being rigged up. As the week closed tubing was being run at the Benton & Holmes No. 1 J. Bowers, discovery well. Operators expected to have the Railroad Commission's potential test completed early this week. Production is from the Strawn sand at 2,887-98 feet. The well is expected to make about 500 bbls. daily on its potential test.

Baylor County's new pool, opened by British American Oil Co. on the C. Green lands of Section 215, T.&N.O. Survey, about 10 miles east of Seymour, has a second well nearing the pay zone. Considerable attention is being shown this test as the discovery well produced 268 bbls. of oil and 190 bbls. of water per day. The second test, last reported drilling at 1,400 feet, three-fourths of a mile southwest of the discovery well is contracted to 5,500 feet, but as it drills through the producing formation of the discovery well much information as to the field's potentiality is expected to be gained.

Prospective third producer for the deep Walnut Bend Strawn pool of northeastern Cooke County, and a new wildcat to seek the Voth pool pay horizon featured the developments in that county. In the Walnut Bend pool, Sinclair Prairie Oil Co. No. 3 Best, 660 feet west of the discovery well, cored the Strawn oil pay at 4,925-40 feet. Casing has been cemented on top of the pay section and plug was to be drilled the first of this week. Also in Cooke County and 2 miles west of the Muenster area, J. G. Richards & Son and associates have made location for No. 1 George Peery, a wildcat in the Thomas Toby Survey, Abstract 1047. This is a proposed 2,000-foot test and will seek the Ellenburger, lower Ordovician, pay of the discovery well in the Voth pool, about 3½ miles southeast.

NORTH TEXAS COMPLETIONS

Archer County

Bridwell Oil Co. No. 1 Harrison, 1,129 feet, dry. Continental Oil Co. No. 2 A. J. DeMoss, 979-88 feet, 45 bbls. S. H. Fagadau No. 2 Anna Abercrombie, 1,300 feet, dry. C. H. Staley No. 12 Mangold, abandoned location.

Baylor County

British American Oil Producing Co. No. 1 F. C. Green, 2,578-2,629 feet, 235 bbls.

Clay County

Duncan, Arnhold and others No. 5 T. P. Duncan, 1,137-66 feet, 165 bbls. W. H. Metzner No. 12 J. J. Taylor, abandoned location.

Cooke County

Whitfield, Pearson & Grimes No. 2 V. Voth, 1,783-93 feet, 302 bbls. in 17 hours.

Wichita County

Dorian & Jackson No. 3 L. C. Denny, 180-90 feet, 5 bbls. J. E. Dunaway and others No. 5 W. T. Waggoner, 1,838 feet, dry. R.G. Drilling Co. No. 1 G. W. Lewis, 3,725-3,835 feet, 725 bbls. Rex Smith No. 1-A L. C. Denny, 3,850-4,006 feet, 720 bbls. Venmex Oil Co. No. A-2 W. S. Griffin, 3,736-3,829 feet, 1,175 bbls.

Young County

P. Atchley No. 1 City National Trust, 998 feet, dry. F. W. Bennett No. 1 R. V. Tidwell, 3,236-3,674 feet, 237 bbls. Fain-McGaha Oil Corp. No. 1 Mrs. D. E. Logan, 5,090 feet, dry. Petroleum Production Co. No. 14 J. L. Boone, 493-507 feet, 5 bbls. Pitzer, West & Lion No. 1 Robert Bullock, 4,169-4,339 feet, 802 bbls. Reno Oil Co. No. 1 Mrs. A. Thomas, 4,840 feet, dry.

EASTERN TEXAS

DALLAS, Tex., Feb. 6.—Lower Marine Trinity activity for another week centered the attention of operators in the eastern Texas area as the fourth test at Opelika in Henderson County was completed as a distillate well to limit oil possibilities in the field. A new deep Marine test was announced.

The Tide Water-Seaboard and Humble companies have completed their No. 1 S. S. McGee, in the Opelika area of northwestern Henderson County as a distillate well making 436 bbls. on a 24-hour gauge. The flowing pressure of the deep well was 1,900 pounds on casing and 1,625 pounds on tubing while the shut-in pressures mounted to 3,230 pounds on casing and 3,100 pounds on tubing. The well averaged 1,000,000 cu. ft. of gas per 64 bbls. of distillate on its official production gauge through one-half inch choke. The test was shut in as the week closed and operators were tearing down rig. Production in the deep test is from the Glen Rose of lower Marine Trinity and is coming from perforations in casing from 8,170 feet to 8,180 feet.

Upshur County received a new, and the first in many months, proposed Marine wildcat test. It will be carried to the basal Glen Rose expected at around 6,500 to 7,000 feet. Operators are R. E. L. Johnson and associates and they have elected to carry their No. 1 Parker, in the Coy Survey, 8 miles northwest of Gilmer, to the deep formations providing it continues to run high structurally, as it has thus far. The test is running some 100 to 275 feet higher on the base of the Pecan Gap marker than two failures drilled in that vicinity. Operators report they have been assured of major company backing in the event the test continues favorable. The test is drilling below 2,963 feet.

Cayuga Operators Take a Cut

Majority of Cayuga field operators in a meeting at Dallas last Friday decided to take a substantial cut in crude price rather than have no outlet for their full allowable. At present, Tide Water Associated Oil Co., the only buyer in the field, is paying 81 cents and taking 25 per cent of the wells' allowables due to loss of a marketing contract at the first of the year. At the meeting it was decided to accept Pan American Pipe Line Co.'s proposal to buy 6,000 bbls. daily, putting Cayuga crude on a parity with Talco and competitive asphalt crudes. It was believed, however, that the price posted would be at least 5 cents higher than the 55-cent price now in effect at Talco. Under the new agreement Tide Water will continue to handle its own production of 1,500 bbls. per day, but not that which it has in common with Seaboard Oil Co.

First attempt in several months at extending the east side of the Talco field of Titus and Franklin counties was under way as the week closed. Humble Oil & Refining Co. was starting work on No. 1 T. G. Temple, nearly a mile from nearest production of the east side of the pool. The well is in the northeast corner of a 50-acre tract in the William N. Baker Survey.

In the Navarro Crossing pool of Houston County, Humble Oil & Refining Co. has completed its sixth oil producer. The company's No. 2 Jim Burns, offset to the discovery well in the pool, was completed flowing 6 bbls. of oil per hour. Rig is being moved to No. 1 Tom Tryon location on the east side of the pool.

A new wildcat is being rigged up a half mile north of the Flag Lake pool in Henderson County with expectation of extending the area in that direction. Since the field's discovery late in 1937, most of the extension activity has been south of the original discovery well. The new outpost will be drilled by Watts & Upchurch as their No. 1 Flag Lake School.

Rusk County's closely watched wildcat, Ham & Boggess No. 1 Griffin, in the John Raldoph Survey, in the Mount Enterprise area, has been plugged and abandoned at a total depth of 3,661 feet in the Georgetown lime. The wildcat missed the contracted Woodbine sand section.

EAST TEXAS FIELD COMPLETIONS

(One hour tests)

Gregg County—Longview Area

General American No. 27 G. E. McGrede, 3,622-31 feet, 60 bbls. Iowa-Payne No. 8 J. W. Akin, 3,511-3,578 feet, 60 bbls. G. E. Hubbard No. 5 J. G. McGrede, 3,637-59 feet, 60 bbls. Lucy Petroleum Co. No. 13 McBee Fisher, 3,488-3,511 feet, 70 bbls. Shell Petroleum Corp. No. 28 H. Hampton, 3,615-3,742 feet, 60 bbls. Strebar Oil No. 2 Finley-Thomas, 3,502-07 feet, 54 bbls. Sun Oil Co. No. 8 J. L. Reppond, 3,622-58 feet, 45 bbls. W. & R. Investment Co. No. 4 W. A. Moore, 3,528-58 feet, 90 bbls.

Gregg County—Kilgore Area

Atlantic Refining Co. No. 22 L. P. Griffin, 3,529-3,604 feet, 20 bbls. Byrd-Frost No. 2 W. Holt, 3,631-45 feet, 60 bbls. T. D. Humphries No. 27 Angus Spear, 3,536-77 feet, 52 bbls. Humble Oill & Refining Co. No. 22 Dura Thomas, 3,545-98 feet, 35 bbls. M. Nathan No. 4 W. B. Walker, 3,606-07 feet, 24 bbls. Overton Refining Co. No. 33 I.&G.N. R.R., 3,540-60 feet, 40 bbls. Shell Petroleum Corp. No. 27 Willoughby, 3,540-3,607 feet, 60 bbls.

Rusk County—Kilgore Area

Gulf Oil Corp. No. 23 W. G. Sexton, 3,602-62 feet, 35 bbls. Humble Oil & Refining Co. No. 42-A S. S. Laird, 3,630-78 feet, 40 bbls.

Rusk County—Joiner Area

O. R. Cooper No. 3 A. J. and D. F. Deason, 3,630-60 feet, 70 bbls. Humble Oil & Refining Co. No. 63

A. D. Blackwell, 3,642-43 feet, 44 bbls.; No. 64 A. D. Blackwell, 3,634-35 feet, 70 bbls.; No. 65 A. D. Blackwell, 3,627-28 feet, 60 bbls.

Upshur County—Longview Area

John Yule No. 1 J. H. Speppard, 3,674-78 feet, 60 bbls.

EAST CENTRAL TEXAS COMPLETIONS

(24-hour tests)

Morris County

V. A. Hughes No. 1 Eugene Hall, dry and abandoned at 4,314 feet.

Rusk County

Ham & Bogges No. 1 Ash Griffin, dry and abandoned at 3,631 feet.

Titus County

Humble Oil & Refining Co. No. 1 Clark-fee, 4,192-4,350 feet, 35 bbls.

Oklahoma Fields

(Continued from Page 94)

22-2s-2w, found sand at 801-28 feet, total depth 833 feet, and pumped 8 bbls. of oil in 24 hours.

Southwestern Oklahoma

Magnolia Petroleum Co. No. 4-B Lackey, SE NW NW Section 11-5-9w, Cement field, Caddo County, an old well bottomed at 2,400 feet, was deepened to 3,378 feet and flowed 852 bbls. of oil in 17 hours, recompleted. Production was from sand at 3,323-47 feet and 3,352-78 feet.

McAllister & Lewis No. 1 Parrett, SE NW SW Section 1-2s-8w, Empire field, Stephens County, was abandoned at 1,513 feet, total depth, in shale.

McNess No. 1 Bohannon, SW NW SE Section 33-6s-5w, Jefferson County, was dry and abandoned at 1,530 feet, total depth.

S. D. Mitchell and associates No. 1 Myer, NE NE NW SW Section 24-1n-17w, Tillman County, was abandoned at 608 feet, total depth.

Magnolia Petroleum Co. No. 7 Hedlund, SE NW NE Section 11-5-9w, Cement field, Caddo County, an old well being deepened from 3,872 feet, old total depth, was drilling below 3,885 feet in broken sand.

C. W. Tomlinson No. 4 Montgomery, NW NW SE Section 11-2s-8w, Comanche pool, Stephens County, was a location.

Ohio Fields

(Continued from Page 91)

feet. In Newark Township, B. G. Davis No. 1 G. P. Macklin, east part of first quarter, is good for 100,000 cu. ft. of gas open flow from the Clinton sand at 2,598-2,626 feet.

In Medina County, Hinckley Township, Harry Dempsey No. 1 Charles Rhodes, Lot 51, is a Clinton sand gas well with an open flow of 400,000 cu. ft. of gas; pay at 3,495-3,515 feet.

In Meigs County, Rutland Township, H. M. Wilford No. 1 A. H. Eblin, Section 19, was dry at 860 feet. In Salisbury Township, Ohio Fuel Gas Co. No. 3 R. E. Archer, Section 33, has an open flow of 130,000 cu. ft. of gas from the Maxon sand at 969-1,026 feet. P. L. Peoples and others No. 1 Harriett Musser, Section 34, is a Salt-sand gas well, gauging 600,000 cu. ft. at 805-07 feet. A. N. Bengel No. 1 William Seyfried, Section 34, was abandoned as dry at 898 feet.

In Noble County, Wayne Township, Section 34, Yoker Valley Oil & Gas Co. No. 1 E. B. Ward, gauged 1,000,000 cu. ft. of gas, open flow, from Berea sand at 1,416 feet.

In Stark County, Plain Township, Sharack and others No. 1 Homer Essig, Section 14, found the Clinton sand dry; total depth 4,724 feet.

Lima Field

There were two completions in the northwestern Ohio area. Russell Johnson No. 1 Nevin Fry, Section 3, Liberty Township, Seneca County, topped the Trenton at 1,338 feet with a showing of oil and gas at 1,433-88 feet; an 800-pound dynamite shot failed to make it a commercial producer.

In Logan County, McArthur Township, Lake Gas Co. completed a small gas well on the Alvin McCollough tract, Section 7. The top of the Trenton was at 1,352 feet; total depth 1,383 feet.

Summary of California Oil Field Operations, Nov., 1938

According to figures collected by the American Petroleum Institute, the total production of crude oil in California for November amounted to 19,883,988 bbls., an average of 662,800 bbls. per day. This is an increase of 3,988 bbls. per day over October production.

Sixty-five wells were completed during the month with an initial daily production of 69,534 bbls., compared with 88 wells completed during October with an initial production of 67,600 bbls.

OIL FIELD DEVELOPMENT

	New rigs up	Active drilling	Producers completed	Daily initial output	Active producing	Abd. wells: Drillers	Abd. wells: Producers
Group 1:							
Belridge—North	2	5	2	4,748	60	...	...
Belridge—South	1	...	1	30	87	...	...
Canal	2	3	1	2,955	14	...	...
Canfield ranch	...	...	...	.....	1	...	...
Coalinga	5	6	1	3,038	795	...	2
Coles Levee	...	...	1	826	1	...	...
Edison	1	1	1	200	88	...	1
Elk Hills	1	...	...	.....	166	...	...
Fruitvale	...	1	...	.....	173	...	...
Greeley	1	5	...	.....	16	1	...
Kern River	...	1	2	27	1,357	1	...
Kettleman Middle Dome	...	...	...	.....	3	...	...
Kettleman North Dome	1	9	2	8,942	209	1	...
Lost Hills	...	1	...	.....	235	1	...
McKittrick	1	...	...	.....	182	...	...
Midway-Sunset	1	4	1	12	2,463	...	1
Mountain View	...	...	1	294	185	...	...
Mount Poso	2	3	...	.....	267	1	...
Rio Bravo	...	2	5	20,611	24	...	...
Round Mountain	3	1	2	460	207	...	...
Ten Section	...	1	...	.....	33	...	...
Tupman	...	...	1	3,752	1	...	...
Wasco	2	...	1	6,528	3	2	...
Wheeler Ridge	...	1	...	.....	27	...	...
Group 2:							
Capitan	...	...	...	.....	52	...	...
Elwood	...	...	...	.....	80	...	...
Rincon	...	1	1	374	51	...	...
San Miguelito	...	2	...	.....	18	...	...
Santa Barbara	1	...	...	.....	34	...	...
Santa Maria	...	1	1	700	296	1	...
Summerland	1	...	...	.....	18	...	...
Ventura Avenue	2	10	2	121	246	...	...
Ventura-Newhall	5	10	1	117	557	...	...
Watsonville	...	...	...	.....	7	...	...
Group 3:							
Brea-Olinda	...	2	...	.....	348	...	...
Coyote—East	...	2	...	.....	85	...	...
Coyote—West	...	...	...	.....	55	...	...
Dominguez	2	1	2	310	205	...	...
El Segundo	...	...	...	.....	55	...	2
Huntington Beach	4	3	2	123	549	1	1
Inglewood	...	...	...	.....	209	...	...
Lawndale	...	...	...	.....	6	...	...
Long Beach	...	4	1	400	1,258	...	2
Los Angeles	...	...	...	.....	112	...	...
Montebello	7	3	4	3,044	212	...	...
Playa Del Rey	...	...	...	.....	186	...	2
Potrero	...	...	1	600	13	...	...
Richfield	1	2	2	120	293	1	...
Rosecrans	4	11	3	3,090	111	...	1
Santa Fe Springs	...	1	...	.....	584	...	...
Seal Beach	...	...	...	.....	113	...	...
Torrance	7	16	12	2,501	654	...	1
Whittier	...	...	...	.....	138	...	...
Wilmington	8	8	10	5,611	585	1	1
Miscellaneous drilling	7	38	...	.....	.....	12	...
Group 4—gas fields:							
Buena Vista Lake	...	...	...	.....	5	...	...
Buttonwillow	...	1	...	.....	28	...	...
Chowchilla	...	...	...	.....	.....	...	...
Delano	...	...	...	.....	.....	...	...
Dudley Ridge	...	...	...	.....	.....	...	...
Goleta	...	...	...	.....	.....	...	...
McDonald Island	...	...	...	.....	4	...	...
Rio Vista	...	...	1	gas	15	...	...
Semi-Tropic	...	...	...	.....	1	...	...
Tracy	...	...	...	.....	5	...	...
Total November	72	160	65	69,534	13,785	23	14
Total October	83	162	88	67,600	13,708	15	19
Decrease (*increase)	11	2	23	*1,934	*77	*8	5

CRUDE PETROLEUM PRODUCTION

(Figures of production and stocks are in barrels of 42 gals.)

	Total production November	Daily average Nov., 1938	Daily average Oct., 1938	Daily average Nov., 1937
Group 1:				
Belridge—North	374,938	12,498	12,698	16,673
Belridge—South	34,048	1,135	1,097	1,492
Canal	106,363	3,545	3,355	570
Canfield ranch	1,731	58	94	.....
Coalinga	243,723	8,124	8,921	15,688
Coles Levee	4,795	160	.....	.....
Edison	77,880	2,596	2,669	3,948
Elk Hills	306,707	10,224	10,290	11,001
Fruitvale	233,508	7,784	7,746	8,024
Greeley	72,578	2,419	*2,836	2,818
Kern River	338,418	11,280	11,499	14,947
Kettleman Middle Dome	1,141	38	36	96
Kettleman North Dome	1,837,901	61,263	62,183	81,689
Lost Hills	97,647	3,255	3,355	4,214
McKittrick	106,107	3,537	3,142	4,506
Midway-Sunset	1,665,222	55,507	56,382	74,115
Mountain View	278,950	9,298	9,223	16,022
Mount Poso	424,336	14,145	14,931	21,010
Rio Bravo	291,128	9,704	7,358	1,617
Round Mountain	384,484	12,816	13,031	16,191
Ten Section	263,895	8,797	8,531	3,411
Tupman	1,668	56	.....	.....
Wasco	14,110	470	377	.....
Wheeler Ridge	9,355	312	306	313
Group 2:				
Capitan	86,388	2,880	2,977	3,039
Elwood	150,062	5,002	5,126	7,931
Rincon	124,227	4,141	3,423	3,756
San Miguelito	77,550	2,585	2,818	3,472
Santa Barbara	11,843	394	385	557
Santa Maria	577,585	19,253	18,400	13,797
Summerland	963	32	46	34
Ventura Avenue	1,018,298	33,943	34,332	36,432
Ventura-Newhall	166,309	5,544	5,499	5,181
Watsonville	900	30	30	60
Group 3:				
Brea-Olinda	169,799	5,660	5,705	6,148
Coyote—East	91,905	3,064	3,256	4,345
Coyote—West	239,166	7,972	7,999	9,541
Dominguez	820,025	27,334	26,061	29,529
El Segundo	168,723	5,624	5,882	19,105
Huntington Beach	933,060	31,102	31,600	36,018
Inglewood	401,997	13,400	13,499	16,104
Lawndale	2,070	69	70	89
Long Beach	1,607,989	53,600	54,548	57,866
Los Angeles-Salt Lake	15,445	515	573	572
Montebello	467,147	15,572	14,116	7,443
Playa Del Rey	169,676	5,656	5,934	7,736
Potrero	19,024	634	600	418
Richfield	261,908	8,730	8,729	9,424
Rosecrans	471,976	15,703	14,016	4,553
Santa Fe Springs	918,475	30,616	30,283	41,575
Seal Beach	241,264	8,042	8,051	9,331
Torrance	579,094	19,303	19,990	7,732
Whittier	28,055	935	912	908
Wilmington	2,893,332	96,444	93,652	60,947
Total November	19,883,988	662,800	658,812	701,988
Total October	20,423,178	658,812	.....	.....
Increase (*decrease)	*539,190	3,988	.....	.....

*Corrected figure. Due to typographical error, this was overstated by 100 bbls. in last month's summary.

STOCKS HELD IN PACIFIC COAST TERRITORY BY CALIFORNIA OIL COMPANIES

	Nov. 30, 1938	Oct. 31, 1938	November changes	Dec. 31, 1937 reclassified
1. Gasoline-bearing crude	35,965,731	34,766,423	+1,199,308	29,417,842
2. Nongasoline-bearing crude	16,747,432	17,144,854	—397,422	14,384,000
3. Unblended natural gasoline	2,974,191	3,038,914	—64,723	2,001,204
4. Gasoline (not including distributing and service stations)	12,985,975	12,506,153	+479,822	13,520,678
5. Naphtha distillates	*1,435,281	*1,383,671	+51,610	*1,464,577
6. Gas oil and Diesel oil	10,685,631	10,878,753	—193,122	8,648,990
7. Fuel oil residuum	70,851,285	70,190,421	+660,864	54,145,388
8. All other stocks	5,949,173	5,413,051	+536,122	4,457,568
Total	157,594,699	155,322,240	+2,272,459	128,040,247
*Estimated amount of unfinished gasoline contained in Item 5	1,199,560	1,162,298	.....	1,248,291

Important Wildcats Started in Widely Scattered Places

By D. H. STORMONT

FORT WORTH, Tex., Feb. 6.—Important outposts to the North Cowden pool and the Foster pool of Ector County, and several widely separated wildcats throughout the north basin area centered the attention in the West Texas district.

Ector County's Foster pool received a three-quarters mile east extension closely followed by the staking of two tests in the intervening area and west of the North Cowden pool of the same county, Continental Oil Co. is attempting to establish a link with the Goldsmith pool 3 miles farther west. The Continental Oil Co. No. 1 Mrs. L. E. Wight, in Section 8, Block 43, T.&P. Survey and 1½ miles west of the North Cowden pool, was preparing to deepen past 4,350 feet as the week closed. In drilling from 4,300 feet to 4,350 feet the test penetrated several saturated zones, the most productive of which yielded only 26 bbls. of oil in 24 hours. Considerable interest is being shown this test due to its possibility of establishing a single structure for the North Cowden and the Goldsmith pools.

Early last week the M. B. K. Drilling Co. completed its No. 1 John M. Gist, Section 9, Block 42, T.&P. Survey, for a three-quarters mile east extension to the Foster pool. As the week closed, Broderick & Calvert staked location for two tests in the Bagley lands between the extension well and the pool proper. Both tests are in the NE quarter of Section 17, Block 42, T.&P. Survey.

The completion of two tests in Andrews County, one an oil well and the other a dry hole, and the staking of another and the third test in as many weeks for Irion County were also reported from the south basin area.

J. W. Tripplehorn, Fort Worth operator, who some time ago took over No. 1 Munger & Nix wildcat in Andrews County, completed the well for 146 bbls. of oil per day. The 160-acre drilling site and lease equipment had been assigned to Tripplehorn with Seaboard Oil Co. retaining a one-sixteenth overriding royalty. The well is located in Section 1, Block 41-A, P.S.L. Survey, 3½ miles southwest of the Deep Rock area. Another Andrews County wildcat test, the Honolulu Oil Corp. No. 1-18 Parker, Section 18, Block 44-A, P.S.L. Survey, 1 mile south of the two-well Parker area, has been plugged and abandoned after encountering sulfur water at 4,798 feet, total depth.

In Irion County, the third wildcat test started in the last few weeks has been spudded by Moore Brothers as their No. 1 Continental-Tippett, in the southwest corner of the R. Rodriguez Survey on lands owned by H. R. Wardlaw, Jr. It is understood that the well will be drilled to the Permian horizon.

A wildcat in northeastern Glasscock County, southeast of production in the Howard-Glasscock pool, has been staked by J. R. Petty. It will be No. 1 Blake, NW cor. E half Section 163, Block 29, W.&N.W. Survey, three-quarters of a mile southeast of the extension area of the Howard-Glasscock pool.

North Basin Area

Wildcat activity in three widely separated North Basin counties including Borden, Dickens and Cochran, held the interest in that area. In Borden County Continental Oil Co. made a location on its solid block of 16 sections in the southern part of the county. It will be known as No. 1 T. A. Munger, SW cor. Section 38, Block 31, T.&P. Survey. It is contracted to go to 3,500 feet and drilling will commence immediately. There are two failures in the general vicinity of the new test, one at 3,450 feet and one at 3,538 feet, both 8 or 9 miles to the northwest of the location.

In Dickens County, Humble Oil & Refining Co. was reported coring 10 feet of sand, bearing an oil odor, from 4,989 feet to 4,999 feet, total depth. The test was last reported shut down with future plans undecided. Several showings of oil have been found in the course of drilling. The test is located in Section 26, Block 1, Chock & Arnold Survey, on a large block held by the operators.

Cochran County's wildcat test, T. G. Shaw No. 1 C. S. Dean, 2½ miles northwest of the discovery well in the Dean area, was scheduled to start drilling plug at the close of the week. Casing had been cemented at 4,800 feet above which depth saturated lime and broken showings of oil in sands were encountered.

In Gaines and Yoakum counties, the Osage Drilling Co. is planning two wildcat tests, one in each of the counties. The operator is in the process of completing arrangements for the Gaines County test and the Yoakum location has already been made.

The proposed location for the wildcat in Gaines County is the center of the NW quarter of Section 20, Block 7-A, P.S.L. Survey. The Yoakum County location is in Section 898, on lands owned by Mrs. Ned O. Miller. It will be about 1½ miles west of the Gulf Oil Corp. No. 1 Lucy K. Moore, completed late last year for an initial of 464 bbls. daily to extend the Denver area 1½ miles to the west.

Due to lack of outlets, activity in the entire North Permian basin has been confined in the past several months almost entirely to drilling forced offsets and to meet lease expirations. This situation, however, is expected to be greatly alleviated in the near future if present plans for a new refinery at Levelland and two pipe lines connecting these fields to trunk lines are carried out. Humble Pipe Line Co.'s 12-inch line running to Hobbs is the only outlet for all the north basin fields, except that trucked to nearby towns, and this line is full to capacity. At present Humble is taking only 85 per cent of the well allowables in Wasson and Bennett due to its physical inability to handle more.

WEST CENTRAL TEXAS

Extensions for Jones County's Griffin pool and Young County's Knight pool, together with the staking of several new wildcat locations in the general area, featured the week's development in the West Central Texas district.

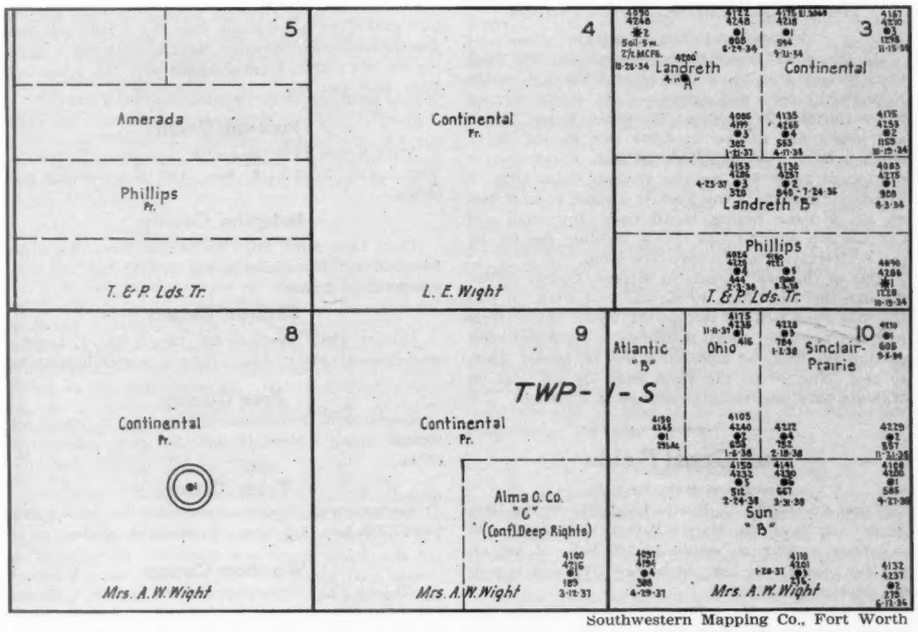
The Griffin pool received a south extension when Bert Fields completed his No. 1 Humphrey, NE cor. NE Section 22, H.&T.C. Survey. The well flowed an estimated 165 bbls. of oil per hour from the Palo Pinto lime pay of the pool. It is bottomed at 3,251 feet with casing set at 3,239 feet. Activity is increasing each week in this new pool and at present there are five drilling wells and eight or nine tests preparing to drill.

Extension to Young County's Knight pool a quarter of a mile to the northwest was assured when the outpost drilled by C. A. Lupton and associates on the B. B. Teague lands of the E. Colthrop Survey, began flowing oil at the rate of about 200 bbls. per day. Production gauge is scheduled for the close of the week. Two more tests by the same operator are due to be spudded at the start of the coming week. Both of the new tests are in the M. Dobbs Survey, Abstract 1416, about 2 miles southwest of the town of Graham.

New wildcat locations were made in the West Central Texas area, one each in Jones, Taylor, Shackelford, Throckmorton, Eastland and Callahan counties. The new Jones County location was staked by F. E. Stanton as his No. 1 W. S. Steen, east of Anson and in the NE cor. Section 16, Block 1, T.&N.O. Survey.

The new Taylor County test will be Huylar W. Lee No. 1 Mabel Neill, on a 2,000-acre block a half mile northeast of the town of Tye. It is in Section 34, Block 17, T.&P. Survey, and will seek production from around 2,500 feet. About 6 miles northeast of the Cook pool in Shackelford County, D. B. Taylor will drill No. 1 Nail, Section 76, E.T.R.R. Survey. The wildcat is in the central part of the county and on a block of 960 acres.

The new Throckmorton County wildcat will be A. G. Bender and associates No. 1 Morrison, southeast quarter of Block 1614, T.E.&L. Survey, 8 miles southwest of



Southwestern Mapping Co., Fort Worth

Continental Oil Co. is attempting to establish an extension to the North Cowden pool of Ector County and possibly a link with the Goldsmith pool some 3 miles to the west

the town of Throckmorton. It is on a 2,500-acre block.

Wildcat oil production in Eastland County will be sought by W. R. Richie and others at a test staked in the west 24 acres of Section 2054, T.E.&L. Survey. It is in the northern part of the county and will seek production from the Strawn sand. It is possible that the test will be carried to the Lake sand from which G. W. Rich and associates discovered a new pool in Stephens County.

Promise of a 2,000-foot test in the shallow Clark pool area of Callahan County, near Putnam, was seen as Iron Mountain Oil Co. prepared to start the first of three proposed tests in the area. The new well in the SW quarter of Section 305, S.P. Survey, and on a tract of 480 acres which calls for the drilling of three shallow tests.

PANHANDLE FIELD COMPLETIONS
(24-hour tests)

Carson County

Cities Service Oil No. 28-A S. B. Burnett, 2,496-2,647 feet, 42,350,000 cu. ft. gas. Haze & McGill No. 6 E. Cooper B, 3,098-3,153 feet, 510 bbls.

Collingsworth County

White & Knoll No. 1 Wischkaemper, dry and abandoned at 2,377 feet.

Deaf Smith County

D. B. Roberson No. 1 Buela Fuqua, dry and abandoned at unreported depth.

Gray County

Bradshaw Oil & Gas No. 9 Sackett, 3,297-3,308 feet, 338 bbls. Continental Oil Co. No. 2 J. T. Benton, 3,132-3,298 feet, 625 bbls. Magnolia Petroleum Co. No. 6 Tom Catlin, 3,178-3,233 feet, 334 bbls.

Hutchinson County

Phillips Petroleum Co. No. 3 Lone Star, 3,136-84 feet, 193 bbls. Texilvania Oil No. 6 Harvey Sisters, 2,995-3,055 feet, 481 bbls. Tide Water Oil Co. No. 5 Hugh Umphries, 3,157-92 feet, 326 bbls.

WEST TEXAS FIELD COMPLETIONS
(24-hour tests)

Andrews County

Barnsdall Refining Co. No. 6 Ford, 4,300-4,455 feet, 1,474 bbls. Rogers & Rogers No. 1-B University, dry and abandoned at 4,451 feet.

Cochran County

Texas Co. No. 1 H. T. Boyd, 5,054-86 feet, 239 bbls.

Crockett County

Gilcrease Oil Co. No. 2-13 University, 1,356-1,400 feet, 70 bbls.

Ector County

Arrow Drilling Co. No. 6 H. C. Foster, 4,225-4,325 feet, 1,067 bbls. Atlantic Refining Co. No. 4-B Johnson, 4,160-4,276 feet, 314 bbls.; No. 3-D University, 3,410-3,650 feet, 1,560 bbls. Broderick & Calvert No. 15 Foster, 4,065-4,230 feet, 1,198 bbls. Cities Service Oils No. 1-F Cummins, 4,210-75 feet, 309 bbls. Landreth Production Co. No. 5-M Scharbauer, 4,153-4,185 feet, 816 bbls. M. B. K. Drilling Co. No. 3-C Foster, 4,188-4,290 feet, 401 bbls.; No. 4-C Foster, 4,188-4,290 feet, 1,993 bbls.; No. 1 John Gist, 4,170-4,277 feet, 1,341 bbls. Phillips-Pure No. 51 C. Cowden, 4,100-55 feet, 1,304 bbls.; No. 53 C. Cowden, 4,100-4,200 feet, 129 bbls. Shell Petroleum Corp. No. 5-D University, 3,380-3,644 feet, 1,167 bbls. Stanolind Oil & Gas Co. No. 75 J. M. Cowden, 4,085-4,323 feet, 1,227 bbls.; No. 8 Witcher, 4,010-4,195 feet, 1,026 bbls.

Gaines County

Amerada Petroleum Corp. No. 2 Riley, 5,152-5,224 feet, 1,558 bbls.

Pecos County

British American No. 11 Payton, 2,042-89 feet, 344 bbls. Union Oil & Mining Co. No. 2-D Magnolia, 1,795-1,875 feet, 477 bbls.

Howard County

Magnolia Petroleum Co. No. 9 Hyman-Chalk, 2,740-2,889 feet, 1,503 bbls. F. W. Merrick, Inc. No. 5-B Chalk, 2,748-2,891 feet, 1,488 bbls. Moore Brothers No. 6-A M. H. O'Daniel, 2,696-2,841 feet, 840 bbls. Murko Oil & Royalty Co. No. 5-A Chalk, 2,808-89 feet, 1,752 bbls. Shell Petroleum Corp. No. 6-A T.&P., 2,620-2,821 feet, 345 bbls.

Upton County

Anderson & Prichard No. 1 Burleson, 2,167-2,207 feet, 985 bbls. Shell Petroleum Corp. No. 7 Baker, 2,168-2,235 feet, 720 bbls.; No. 39 Della Bowen, 2,106-2,130 feet, 307 bbls. Sylva Oil Co. No. 10 Baker, 2,325-67 feet, 1,016 bbls.

Ward County

Cities Service Oil Co. No. 3 Bradenburg, 2,048-88 feet, 262 bbls. Daniel & Pardue No. 2 Hartag-Wilson, 2,366-2,420 feet, 85 bbls. Roeser & Pendleton No. 1-B Johnson, 2,015-67 feet, 106 bbls.

Winkler County

Magnolia Petroleum Co. No. 212 Walton, 3,200-75 feet, 807 bbls. Texon Oil & Land Co. No. 4 Cowden, 2,821-3,093 feet, 364 bbls.

Yoakum County

Continental Oil Co. No. 3 Sue Stevens, 5,010-57 feet, 1,824 bbls. J. E. Mabee No. 3 Willard, 4,985-5,229 feet, 2,271 bbls.

WEST CENTRAL TEXAS COMPLETIONS
(24-hour tests)

Brown County

George Christie No. 1 Henslee, dry and abandoned at 1,282 feet. Lynn & Rouch No. 1 Mullis, dry and abandoned at 1,435 feet. Petroleum Production Co. No. 1 Davis, dry and abandoned at 742 feet. Trentman & Harvey No. 1 Sikes, dry and abandoned at 2,625 feet.

Callahan County

Hill No. 1 Blakely, dry and abandoned at 820 feet.

Coleman County

Green & Owens No. 1 Westbrook, 1,880-94 feet, 157 bbls.

Comanche County

Loraine Oil No. 1 Carwile, dry and abandoned at 2,752 feet.

Jones County

Fred Browning No. 1 Avoca School, dry and abandoned at 3,305 feet. Humble Oil & Refining Co. No. 1 Bickley, 3,113-32 feet, 625 bbls. Iron Mountain and Humble No. 2 Taylor, 3,213-32 feet, 549 bbls.

Shackelford County

Fox & Sons No. 2 Nail, abandoned location; No. 3 Nail, abandoned location. Groover & Rose No. 2 Nail, dry and abandoned at 1,450 feet. Lee & Key No. 11 Diller, 518-27 feet, 10 bbls.

New York-Penna. Gas Fields

(Continued from Page 84)

In the other Potter County operations New York State Natural Gas Co. is drilling at 1,050 feet on the F. McCarthy farm and Sylvania Corp. at 250 feet on No. 2 Harrison in Bingham Township; Evjen, Harris and others are drilling at 1,765 feet on the A. R. Mitchell farm, Sweden Township; G. L. Cabot, Inc., is drilling at 2,060 feet on the William Cobb farm in Allegany Township; Penn York is drilling at 4,137 feet on No. 2 Lena Barnes in Harrison Township, and Cunningham Natural Gas Co. is building the rig on the F. Markey farm, Oswayo Township.

One of the two wildcats in McKean County drilled through the Tully lime during the past week. It was the New Penn-McKean test on the Glenn Taylor farm in Ceres Township which is drilling at 4,268 feet after passing the Tully at 3,993-4,038 feet or subsea 2,438-83 feet. The other, the Penn Brad Oil Co. test on Warrant 5574, was reported drilling at 3,750 feet.

Gulf Coast Fields

(Continued from Page 83)

Texas Co. No. 11 St. Martin Land Co., on the Henderson salt dome, St. Martin Parish, is pumping and swabbing, making an estimated 120 bbls. of net oil per day plus 57 per cent salt water. The well is testing sand at 8,060-65 feet.

Sid Richardson No. 1 Haas Investment Co., the discovery well of the Eola field, Avoyelles Parish, is reported to have flowed at the rate of 900 bbls. per day through a 9/32-inch choke. Reports of a pipe line being constructed from the field to Continental Oil Co. tank farm and pump station at Villa Platte in Evangeline Parish could not be confirmed at the close of the week.

In the Baton Rouge field, West Rouge Parish, William Helis No. 5 Duplantier topped sand at 6,451 feet and cored to a total depth of 6,460 feet. Seven-inch casing was cemented at 6,460 feet. The same operator's No. 3 Harry B. Nelson, Section 36, topped sand at 6,455 feet and cored to a total depth of 6,476 feet.

Texas Co. No. 1 School Board, Section 16-17s-24e, Lafitte field, Jefferson Parish, attempted to blow out at a total depth of 11,961 feet, causing the drill stem to become stuck. This well was scheduled to be drilled to 15,000 feet and the blowout shows evidence of opening a new sand for the field.

In southeastern Lafourche Parish, Gulf Oil Corp. has staked location for No. 1 Grandison Co., a wildcat located about 8½ miles northeast of the Leesville field in Section 14-20s-23e.

TEXAS GULF COAST COMPLETIONS IN PROVEN FIELDS

Brazoria County

Hastings field: Humble Oil & Refining Co. No. 4-C Brown, 6,162 feet, abandoned. Old Ocean field: Harrison & Abercrombie No. 4 Armstrong, sand 9,760-10,375 feet, 250 bbls., various chokes; No. 3 Chenault, 10,516 feet, 275 bbls., various chokes. Sun Oil Co. No. 1 William Campbell, perforated casing 10,052-86 feet, 406 bbls., 11/64-inch choke.

Chambers County

Anahuac field: Humble Oil & Refining Co. No. 21 W. C. Tyrell, 7,091 feet, 600 bbls., quarter-inch choke. Seabreeze field: Sun Oil Co. No. 3-A White, perforated casing 8,469½-72½ feet, 2,704,809 cu. ft. of gas.

Galveston County

Dickinson field: Cron & Gracey No. 1 Devant, 9,048½ feet, 50 bbls. distillate. Pure Oil Co. No. 3 Maco Stewart, perforated casing 8,116-23 feet, 96 bbls., quarter-inch choke.

Harris County

Clear Lake field: Humble Oil & Refining Co. No. 4-C Humble-West, 6,042 feet, abandoned. Eureka field: Tide Water Associated Oil Co. No. 3-A Lackner, perforated casing 7,700-05 feet, 143 bbls., eighth-inch choke; No. 1 Max Roy, perforated casing 7,944-49 feet, 254 bbls., three-sixteenths inch choke. Fairbanks field: Amerada-Stanolind Oil & Gas Co. No. 3 Bullimore, perforated casing 6,845½-49½ feet, 63 bbls., eighth-inch choke; No. 2 Marietta, perforated casing 6,833-36 feet, 161 bbls., eighth-inch choke. Housh & Thompson No. 2 Yerkes, sand 6,812-35 feet, 155 bbls., eighth-inch choke. Friendswood field: Humble Oil & Refining Co. No. 9 Godwin, sand 5,999-6,044 feet, 576 bbls., quarter-inch choke; No. 3-B Humble West, 6,044 feet, 576 bbls., quarter-inch choke. Tomball field: Humble Oil & Refining Co. No. 9 Milo, 5,480 feet, gas well; No. 1 Martens, 5,561 feet, gas well.

Jackson County

West Ranch field: Magnolia Petroleum Co. No. 7-A West, sand 5,087-5,113 feet, 165 bbls., eighth-inch choke.

Jefferson County

Clam Lake field: Shell Petroleum Corp. No. 1 McFaddin Trust, perforated casing 2,387-97 feet, 150 bbls., quarter-inch choke.

Orange County

Orange field: Keown Oil Corp. No. 1 Lutcher Moore, sand 5,606-19 feet, 141 bbls., eighth-inch choke.

Polk County

Segno field: Providence Oil Co. No. 2 Wing, perforated casing 8,090-8,114 feet, 720 bbls., quarter-inch choke.

Tyler County

Spurger field: Republic Production No. 16 fee, sand 7,662-7,703 feet, 547 bbls., quarter-inch choke.

Wharton County

Withers field: General Crude Oil Co. No. 1 Thompson, 5,554 feet, 100 bbls., eighth-inch choke. Texas Co. No. 26-B Pierce, sand 5,540-47 feet, 117 bbls., eighth-inch choke; No. 55-C Pierce Estate, sand 5,540-44 feet, 70 bbls. in 14 hours, eighth-inch choke.

Michigan Field Report

By O. C. PRESSPRICH

Monroe Crude Production in Bay County, East Michigan

SAGINAW, Mich., Feb. 6.—Possibility of profitable deep Monroe oil production in eastern Michigan headlined petroleum developments during an otherwise dull week from a new production standpoint. Midwinter snows curbed drilling activity.

The significant development was in Bay County's Monitor Township (14n-4e) where Gulf Refining Co. plugged back a scheduled Sylvania and Saline formation test to the deep Monroe, and logged more than 100 bbls. of oil during three days swabbing. Gulf holds large blocks of acreage in the sector, and the current well has been drilling and testing several months. Dundee limestone production was established in Bay County last summer at two other Gulf locations, but the present Monroe well indicates more profitable production. It is the first Monroe production logged in eastern Michigan.

Clare County fields maintained steady development with a sensational producer in the Redding area last week. While located in the heart of the proven sector, the well nevertheless was considered about the best of the north area producers, estimated at 120 bbls. an hour, although curbed to 250 bbls. daily. It rated more as a sensational producer due to many interior and edge wells having been developed recently in so-called "catch-as-catch can" manner ranging from dry holes to favorable output regardless of their location and offsets.

There were eight new oil wells added in all Michigan fields, and five dry holes. Clare fields logged four producers to lead in new production, while Bloomingdale in Van Buren accounted for three, and Bay County one.

Bay County

Monitor Township (14n-4e)—Gulf Refining Co. No. 1 Bateson, C S half SE SE Section 2-14n-4e, Bay County, held the spotlight of interest and focused attention of operators on eastern Michigan. Operators decided on a production and treat test at the hole after reaching a depth of 3,755 feet in what was scheduled as a Sylvania and Salina-bed test. The hole was bridged back to the deep Monroe at 3,550 feet where it was acid-treated, and responded by swabbing more than 100 bbls. of oil in three days. Operators were much encouraged with results, and further Monroe probing appeared likely. Gulf controls practically all of the acreage in the sector.

Clare County

Freeman Township (18n-6w)—Two producers, one a semi-completion showing water, were listed in Freeman Township last week. C. W. Teater No. 3 Van Horn, SW NW NE Section 3, rated as a 2,000-bbl. natural well, although like all wells in the Clare area it was curbed to about 250 bbls. daily. The voluntary Clare proration curb is 160 bbls. daily for wells in a 10-acre spacing, and 250 bbls. on 20-acre spacing. An edge test being closely watched and still incomplete is Ide & Glavin Development Co. No. 1 Van Horn, SW SE NE Section 3, where a hole full of oil was reported with a quantity of water cutting in similar to other nearby tests in the area.

Redding Township (19n-6w)—Pure Oil Co. No. 1 Davis, C N half NE NE Section 33, in the heart of the proved territory, startled operators with a 120-bbl. an hour flow last week. The showing was unexpected due to many puzzling producers developed nearby recently without regard to known boundaries. Recent experience shows dry holes offsetting good producers in proved territory while edge tests show favorably, but without consistency. Pure's No. B-3 Bicknell, S half NE SE Section 28, was rated at 200 bbls. daily after an acid treatment.

Jackson County

Napoleon Township (3s-2e)—Jackson County's lone wildcat test, J. V. Wicklund Development Co. No. 1 Silence, SE NW NE Section 31, was dry and abandoned.

Midland County

Warren Township (16n-2w)—Failure to log an oil show caused abandonment of C. W. Teater No. 1 Kalmar, SE SE SE Section 31.

Van Buren County

Bloomingdale Township (1s-14w)—Three producers and three dry holes in scattered sectors of Bloomingdale's flush town-lot pool were net results of drilling last week. Winter weather and low crude prices have combined to hold down drilling activity in that section, which since August has mostly dominated new production in Michigan. Bloomingdale Development Co. No. 1 Decker, SE SE SE Section 7, led the western state production with an 800-bbl. daily producer. Bridger Basin Oil Co. No. 4 Cominsky, SW SE NE Section 17, was estimated at 500 bbls., after acid, and J. E. Flanigan No. 3 Barger, NW NE SE Section 17, was acidized to 50 bbls. daily. The three dry holes included the following: Little Four Oil Co. No. 1 Gershi, NE NW SW Section 13; the same company's No. 4 Maier, SE SW NE Section 14, and Borough & Foster No. 1 Schock, NW NE NW Section 15.

Eastern Fields

(Continued from Page 76)

nongahela Oil & Gas Co. is drilling Vance Heirs No. 3 at 1,360 feet. Brummage and others are fishing S. G. Durr No. 1 at 1,850 feet, which is being deepened. In Franklin Township, J. B. Myers and others are starting No. 1 Sallie Morris.

In Perry Township, Greene County, Gartland Oil Co. is drilling at 2,595 feet deepening No. 1 J. L. Donley. In Richhill Township, Burleigh Wright has the rig standing on the Strawn heirs farm. In Morris Township, O. I. Dille and others started drilling the No. 2 Ellsworth Beckham.

Washington County

In North Strabane Township, Washington County, Beedle & DeBone and others are drilling at 2,350 feet in the test on the J. C. McNary farm. In Hopewell Township, McFadden & Co. are drilling at 650 feet in the test on the J. W. Reed farm. In Hanover Township no progress was made in the test of R. M. Duden and others on the Roy Scarum farm. In Amwell Township, A. V. Lewis and others have rigged up No. 2 William Dodds.

Deep Tests

On Chestnut Ridge in Springhill Township, Fayette County, the L. J. Houze Convex Glass Co. resumed drilling in the test on the Paul Dunham farm, and at 7,615 feet a pocket of salt water was struck which was exhausted by two bailers. The brine was very heavy. It is now drilling at 7,623 feet with the same amount of gas as before.

On this structure in South Union Township, Fayette County, the New Penn Development Co., William E. Snee and others resumed drilling the test on the Indian Creek Coal & Coke Co. lease and cleaned out the cement after casing at 6,925 feet. A short fishing job was had when the cable parted just above the tools which were recovered on the next run. In North Union Township, Wasson & Co. have cleaned out the cement to bottom after casing to 6,931 feet in the test on the J. H. Sorg farm and have shut down waiting on a control head.

In Armstrong County, the Peoples Natural Gas Co. are drilling at 150 feet in the deep test on the Lowry Martin farm in Wayne Township.

WEST VIRGINIA

What may be the start of a small pool in Pleasants County, West Virginia, is the second fair-sized producer in Jefferson district. The First National Bank of St. Marys (Schultz Oil Co.) drilled No. 4 on the T. C. Hammett farm to 1,920 feet, the Squaw sand, and it started off at 100 bbls. a day. This is an offset to the G. S. M. Powell farm on which a well larger than this was brought in last month.

In Tyler County, George Kerns deepened No. 1 on the Vietta Ritter farm in McElroy district from 2,139 feet to 2,155 feet, the Big Injun sand, and at 2,150 feet there was about 5 bbls. of oil a day. The Pittsburgh Coal was at 716 feet.

Gas Wells

In Lincoln County, the Woodall Gas Co. deepened the test on the James P. Plumley farm in Union district starting at 1,554 feet with the Big lime at 1,486-1,590 feet; Big Injun 1,605-45 feet; Berea 2,120-49 feet; Brown shale 3,182-3,495 feet and a gauge of 320,000 cu. ft. of gas from the Berea and Brown shales after a shot. Rock pressure is 140 pounds. In Sheridan district, the Sweetland Land & Mineral Co. completed the test on its fee at 2,361 feet with a gauge of 94,000 cu. ft. from the Berea.

In Pleasants County, F. R. Ball completed the test on the L. E. Fleming farm in McKim district at 1,670 feet, the Third Salt sand, as a gas well gauging 53,000 cu. ft. a day. In Union district the test of Grant & Athey on the M. V. Smith farm drilled through to 600 feet in the Cow Run sand was dry.

In Wetzel County, McIntire & Mason completed a gas well on the Wayman heirs farm in Proctor district at 1,187 feet with 200,000 cu. ft. production from Cow Run sand. There was a showing of oil in this formation which may be shot for a test. In this district, Big Four Oil & Gas Trust completed a test on the W. L. Herrick farm at 600 feet, the Cow Run sand, and it is a gas well gauging 150,000 cu. ft. a day.

In the Oriskany Gas pool in Kanawha County, West Virginia, United Fuel Gas Co. is completing No. 4807 on the C. O. Slater and others farm in Poca district with 300,000 cu. ft. of gas as the first showing at 5,094 feet. In this district, the Spartan Gas Co. completed the second well on the Ernest Fisher and others lease at 5,116 feet with the Oriskany topped at 5,097 feet and a final gauge of 15,841,000 cu. ft. a day.

In Poca district, the United Fuel Gas Co. is drilling at 3,805 feet in No. 4768 John Wines and others; at 4,208 feet in No. 4812 J. A. Wines and others; at 4,406 feet in No. 4815 Mamie A. Ray; at 1,691 feet in No. 4817 W. M. Vance; at 4,800 feet in No. 4818 W. H. Fisher; at 1,740 feet in No. 4822 W. F. Beane; at 2,490 feet in No. 4823 G. C. Patterson and others; at 1,125 feet in No. 4825 W. P. Tolbert and others; at 544 feet in No. 4826 Janey Gibson and others; at 946 feet in No. 4827 O. D. Price and others; at 1,330 feet in No. 4828 M. R. Mairs and others with rigs up on the Schmittauer and W. F. Beane farms. In this district, Godfrey L. Cabot, Inc., is shon 4,900 feet in the Putnam Land Co. test and 2,585 feet in the Helen M. Hoge test. The West Virginia Gas Corp. is building a rig on the W. H. and T. E. Reese land. The

Columbian Carbon Co. is drilling at 1,505 feet on the L. M. Fields and others land and in Elk district at 2,350 feet in the M. N. Landers and others test

Outside Deep Tests

In Jackson County, Everett Starcher and others are drilling at 1,881 feet in the R R. Boggess test in Ripley district. Here, the Columbian Carbon Co. is ready to spud the test on the G. W. Lathey farm.

In Ravenswood district, Jackson County, Joe Rubin and N. P. Johnston and others ran 8⅝-inch casing to 1,449 feet in the test on the D. P. Curry farm effectively shutting off the oil from 1,150 feet, and have resumed drilling.

In Pleasants County, the Columbian Carbon Co. is drilling at 4,775 feet in the test on the Giles Hammat farm in Grant district. In Washington district, Jackson County, Godfrey L. Cabot, Inc. have not finished the fishing job in the Oriskany sand in the test on the Walker and Jones lease.

New Work

In Clay County, the Pittsburgh & West Virginia Gas Co. has a location for No. 7667, a test on the D. O. Sirk and others farm in Buffalo district. In Pleasant district, Thompson Gas Co. has a location for a No. T-30 on their own property, elevation 1,379 feet.

In Calhoun County, P. P. Gunn and others have a location for a test on the T. R. Stump heirs farm in Sherman district, elevation 730 feet. Here, W. H. Bickel is rigging up a second test on the Luerna Barr farm. Everett Starcher and others is skidding the rig for a second test on the S. Slider farm, and is drilling in the Big Injun sand in the No. 3 on the C. C. Starcher farm. H. S. Adams has spudded in and started drilling the F. M. Wilmoth Heirs No. 2.

In Glenville district, Gilmer County, Kidd & Marsh are down 1,160 feet on the Glenville State Teachers School land and the Pittsburgh & West Virginia Gas Corp. is drilling at 950 feet in No. T-654 Alex Lyons.

In Kanawha County, Ten Mile Oil & Gas Co. made a location for No. 20 Margaret Y. Dickinson farm in Malden district, elevation 1,364 feet. In Putnam County, Smith & Ellison made a location on the R. C. and Martha Simmins heirs farm, elevation 743 feet.

In Roane County, Rodgers Properties Co. made a location on the O. P. Ball farm, Curtis district, elevation 962 feet. In Harper district, O. H. Reed and others are down 1,670 feet in No. 4 P. V. Litton and R. W. Heasley is drilling at 1,450 feet in No. 1 Joe Fields.

Kansas Fields

(Continued from Page 98)

Butler-Greenwood Counties

S. J. Polhamus No. 1 Clawson, SE SW NW Section 7-24-4, Butler County, topped chat at 2,475 feet, was bottomed at 2,550 feet and was dry and abandoned.

Katz Co. No. 6 Christy, NE SW SE Section 12-26-9, Reece area, Greenwood County, was dry and abandoned at 2,174 feet, total depth.

Landon & Allison No. 1 Marshall, NW NW NE Section 28-27-6, Butler County, was rigging up machine. Smith & Polhamus No. 1-B Albers, Section 21-25-4, Butler County, was moving in material. O. F. Duncan No. 1-A Sanders, C N half SW NW Section 20-23-13, Greenwood County, had spudded.

Rooks County

In the Laton pool, Rooks County, the Krueger No. 3 Tatkenhorst, NE SE SW Section 11-9-16w, pumped 175 bbls. of oil in the first 24 hours and was completed in Lansing-Kansas City lime at 3,240-41 feet, total depth.

Same operator's No. 1-A Krueger, NW NE NW Section 14-9-16w, was rigging up rotary.

New Operations Reported

In Ellis County, Kerlyn Oil Co. No. 8 Rumsey, SE SE SW Section 23-11-17w, was a location.

In Greenwood County, Haman & Roseman No. 2 Duke, Section 22-26-9, had a fishing job at 950 feet.

In Ellsworth County, Continental Oil Co. No. 3-A Ploog, SW NE SW Section 27-17-8w, and same company's No. 2 Fuller, C S half S half SE Section 28-17-8w, were rotary rigs.

Southwest Texas Fields

(Continued from Page 79)

test through perforated casing at 4,175-80 feet, which tested 4,200 feet of salt water with no working pressure. A series of production tests made at various intervals below 3,300 feet showed some oil and gas.

Southwest of the Lopeno gas field, Zapata County, Thompson & Lowe No. 1 Ramirez is bottomed at 2,352 feet and casing is being cemented for a production test. The well is located in the southwest corner of Block 6, Porcion 18. Sand with an oil odor was logged at 2,331-33 feet and at 2,333-38 feet.

In the Balcones Fault Line area, Charles Schreiner is believed to have opened a small field in Bexar County as No. 1 Barney McCloskey is reported to be making an estimated 4 bbls. of oil daily. The hole is bottomed in the Anacacho lime, topped at 1,326 feet, and cored to 1,408 feet. Soft and hard lime with an oil showing was logged at 1,350-1,400 feet. The well is 3 miles northwest of Somerset in the L. Desague Survey No. 134.

SOUTHWEST TEXAS DISTRICT COMPLETIONS IN PROVEN FIELDS

Aransas-San Patricio Counties

McCampbell field: A. D. Corgey and others No. 2 McCampbell, sand record not reported, tight well, initial production 502 bbls., three-sixteenths inch choke. Corgey & Grote No. 1 Nelson, 7,142 feet, 498 bbls., three-sixteenths inch choke; No. 2 Scrivener, sand record not reported, tight well, initial production 498 bbls., quarter-inch choke. Graham Oil Co. and others No. 1-B McCampbell, perforated casing 7,121-24 feet, 509 bbls., three-sixteenths inch choke. L. L. Smith and others No. 1 L. D. Cavitt, perforated casing 7,130-39 feet, 300 bbls., three-sixteenths inch choke.

Caldwell County

Dale field: Taylor Refining Co. No. 4 Miears, 2,450 feet, abandoned. Salt Flat field: H. H. Coffield No. 1-A Smith, 2,698 feet, 100 bbls. oil, 100 bbls. water, pumping.

Calhoun-Victoria Counties

Heyser field: Magnolia Petroleum Co. No. 12 Lander, sand 5,487-95 feet, 41 bbls., eight hours, 7/64-inch choke.

Duval County

Casa Blanca field: Creighton & Moore No. 5-A Martin, sand 1,193-95½ feet, 30 bbls., pumping. Eagle Hill field: Magnolia Petroleum Co. No. 15 Duval County Ranch Co., sand 1,452-58 feet, 35 bbls., pumping. Hoffman field: Argo Oil Corp. No. 1-A Rodden, sand 2,580-2,614 feet, 233 bbls., 20 hours, open tubing. Lundell field: Humble Oil & Refining Co. No. 9-B White, sand 1,532-37 feet, gas well; No. 10-B White, sand 1,541-44 feet, 24 bbls., eight hours, jetting. Rancho Solo field: Lanning and others No. 6 Peters, perforated casing 1,870-78 feet, 101 bbls., jetting.

Hidalgo County

Samfordyce field: Davis & Harrison No. 1 Guerra, perforated casing 2,867-74 feet, 6 bbls. per hour, three-sixteenths inch choke. Weekly Oil Co. No. 3-B Guerra, sand 2,864-80 feet, 100 bbls., jetting.

Jim Wells County

South Alice field: Blanco Oil Co. and others No. 7 Rattan, perforated casing 5,284-91 feet, 178 bbls., 12 hours, 7/64-inch choke. R. B. Bryant No. 3 Stillwell, perforated casing 4,970-80 feet, 75 bbls., eighth-inch choke. Robert Bowles No. 5 Ragland, perforated casing 4,984-90 feet, 19 bbls., six hours, eighth-inch choke.

Milam County

Rockdale field: W. A. Jones No. 1 Timmerman, 545 feet, 2½ bbls., pumping.

Nueces County

Luby field: Seaboard Oil Co. No. 34 Luby, perforated casing 4,357-60 feet, 113 bbls., eighth-inch choke. Stanolind Oil & Gas Co. No. 20 Spessard, 4,358 feet, 124 bbls., eighth-inch choke. Sun Oil Co. No. 6 McCann, perforated casing 5,058-62 feet, 121 bbls., eighth-inch choke. Clara Driscoll field: T. S. Reed No. 4 Bar-

STANDARD OIL CO. OF CALIFORNIA AND UNION OIL CO.
Crude oil prices at the well effective June 22, 1936

Gravity—	Signal Hill (Long Beach)	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda-Brea Canyon	Athens-Rosecrans	Dominguez	Ellwood Terrace	Torrance	Richfield	Whittier E. Coyote (La Habra)	Montebello	W. Coyote Hills	Santa Fe Springs	Mountain View	Elk Hills Buena Vista Hills Midway-Sunset Lakeview Area	Lost Hills	Coalinga	Santa Paula*	Wheeler Ridge	Kettleman Hills	Orcutt*
14-14.9	$.80	$.79	$.74	$.78	$.79	$.80	$.76	...	...	...	$.80	$.76	$.76	$.77	$.78	...	...	$.70	$.70	$.70	...	...	$.70	...
15-15.9	.80	.79	.74	.78	.79	.80	.76	...	...	...	.80	.76	.76	.77	.78	...	...	.70	.70	.70	...	...	.70	...
16-16.9	.80	.79	.74	.78	.79	.80	.76	...	...	...	.80	.76	.76	.77	.78	...	...	.70	.70	.70	...	...	.70	$.70
17-17.9	.80	.79	.74	.78	.81	.80	.76	...	...	...	.80	.76	.76	.77	.78	...	...	.70	.70	.70	...	...	.71	.70
18-18.9	.80	.79	.74	.78	.84	.80	.78	...	...	...	.82	.76	.76	.77	.78	...	...	.70	.70	.70	...	...	.73	.72
19-19.9	.82	.79	.74	.82	.87	.84	.81	...	...	...	.85	.76	.78	.77	.78	...	.$.70	.74	.74	.71	.$.70	...	.75	.74
20-20.9	.85	.79	.74	.85	.90	.88	.84	...	...	...	.88	.78	.82	.77	.80	...	.70	.78	.78	.72	.70	...	.77	.77
21-21.9	.88	.79	.74	.89	.93	.93	.88	...	...	...	.91	.80	.85	.77	.84	$.78	.73	.82	.82	.74	.70	...	.79	.80
22-22.9	.92	.82	.74	.92	.96	.98	.92	...	...	...	.93	.84	.89	.79	.88	.78	.77	.87	.86	.78	.72	...	.82	.83
23-23.9	.95	.86	.77	.96	.99	1.02	.96	$.84	$.79	...	.96	.88	.93	.82	.92	.78	.80	.92	.90	.82	.76	...	.85	.86
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	...	.99	.91	.96	.85	.96	.82	.84	.97	.94	.86	.79	...	.87	.88
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	...	1.02	.95	...	.89	.99	.86	.88	1.01	.98	.90	.88	...	.90	.91
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	...	1.05	.98	...	.92	1.03	.90	.91	1.06	1.02	...	...	...	.92	.93
27-27.9	1.10	1.05	.88	1.11	1.12	...	1.10	1.03	.88	...	...	1.02	...	.96	1.06	.95	.95	1.10	1.06	...	...	...	.95	...
28-28.9	1.14	1.10	.90	1.14	1.15	...	1.14	1.07	.90	...	...	1.06	...	.99	1.10	.99	.99	1.15	1.10	...	...	...	.97	...
29-29.9	1.17	1.15	.93	1.18	1.18	F.O.B.	1.17	1.12	.93	...	...	1.09	...	1.03	1.14	1.03	1.02	1.20	1.14	...	...	...	.99	...
30-30.9	1.21	1.19	.95	1.22	1.21	our	1.21	1.17	.95	F.O.B.	...	...	...	1.07	1.17	1.08	1.06	1.25	1.18	...	...	...	1.01	...
31-31.9	...	...	...	...	1.24	Pipe	1.24	1.22	.97	Ship	...	...	...	1.11	1.21	1.12	1.09	1.29	...	...	...	...	...	...
32-32.9	...	...	...	...	1.27	Line	1.27	1.27	1.00	...	...	...	...	1.14	1.25	1.16	1.13	1.34	...	...	...	...	...	...
33-33.9	...	...	...	...	...	...	...	1.32	...	1.28	...	...	...	1.18	1.28	1.20	1.17	1.38	...	...	...	$1.19	...	...
34-34.9	...	...	...	...	...	...	...	1.37	...	1.32	...	...	...	1.22	1.32	1.25	1.20	...	...	...	...	1.23	...	...
35-35.9	...	...	...	...	...	...	...	1.42	...	1.35	...	...	...	1.25	...	1.29	...	...	...	...	...	1.27	...	...
36-36.9	...	...	...	...	...	...	...	1.46	...	1.39	...	...	...	1.29	...	1.33	...	...	...	...	...	1.31	...	...
37-37.9	...	...	...	...	...	...	...	1.51	...	1.43	...	...	...	1.32	...	1.37	...	...	...	...	...	1.35	...	...
38-38.9	...	...	...	...	...	...	...	1.56	...	...	...	...	...	1.36	...	1.42	...	...	...	...	...	1.39	...	...
39-39.9	...	...	...	...	...	...	...	1.61	...	...	...	...	...	1.40	...	...	...	...	...	...	...	1.43	...	...
40-40.9	...	...	...	...	...	...	...	1.66	...	...	...	...	...	1.43	...	...	...	...	...	...	...	...	...	...

Newhall, McKittrick, Kern River, Kern Front and Round Mountain, 70 cents for all grades. *Posted by Union Oil Co. Same company's Brea Canyon schedule stops at $1.14 for 28 degrees and over, and Belridge and Lost Hills schedule stops at $1.32 for 37 degrees and over. By Standard Oil Co., effective October 15: El Segundo, 14 to 18.9 degrees, 80 cents; 19-19.9, 82 cents; 20-20.9, 85 cents; 21-21.9, 88 cents; 22-22.9, 92 cents; 23-23.9, 95 cents; 24-24.9, 99 cents; 25-25.9, $1.03; 26-26.9, $1.06; 27-27.9, $1.10; 28-28.9, $1.14; 29-29.9, $1.17; 30-30.9, $1.21. Wilmington, 14 to 16.9, 75 cents; 17-17.9, 77 cents; 18-18.9, 79 cents; from 19 degrees upward, prices same as Signal Hill.

low, perforated casing 5,543-48 feet, gas well. Stanolind Oil & Gas Co. No. 3 Kampfhenke, sand 5,434-48 feet, 202 bbls., eighth-inch choke. Rand Morgan No. 2-D fee, perforated casing 5,139-44 feet, 70 bbls. distillate, jetting. Saxet field: Sinclair Prairie Oil Co. No. 3 Isensee, perforated casing 5,777-82 feet, 155 bbls., eighth-inch choke. West Saxet field: Carlos Oil Corp. No. 1 Blucher, perforated casing 4,069-72 feet, 154 bbls., 9/64-inch choke. Renwar Oil Co. No. 1-C Kennedy, perforated casing 4,054-58 feet, 154 bbls., 9/64-inch choke.

Refugio County

La Rosa field: Coronado Corp. No. 4 Spaulding, perforated casing 6,323-26½ feet, 162 bbls., eighth-inch choke. Refugio field: W. F. Morgan, perforated casing 6,330-32 feet, 75 bbls. oil, 300 bbls. salt water, five-sixteenths inch choke.

San Patricio County

Angelita field: Wellington Oil Co. of Delaware, sand 5,374½-76 feet, 20 bbls., 7/32-inch choke. Plymouth field: Plymouth Oil Co. No. 108-C Welder, perforated casing 5,630-34 feet, 5½ bbls. per hour, eighth-inch choke.

Webb County

North Killam field: Superior Oil Co. of California No. 1-C Laurel, sand 2,035½-42½ feet, 30 bbls. fluid, 50 per cent salt water. O'Hern field: Hamill & Smith No. 4-B Benavides, sand 2,879-2,905 feet, 60 bbls., three-eighths inch choke.

Zapata County

Comitas field: Nordan & Morris No. 6-C Haynes, 1,251 feet, abandoned; No. 5-C Haynes, sand 1,129-37 feet, 24 bbls., pumping. Escobas field: Texas Co. No. 125 Measles, sand 1,336-44 feet, 44 bbls., pumping.

Zavala County

Batesville field: H. F. Wilcox Oil & Gas Co. No. 3 Gilliam, 3,857 feet, abandoned.

West Texas Geological Society Elects Haigh

MIDLAND, Tex.—Berte R. Haigh, Midland, geologist in charge of University of Texas lands, has been named president of the West Texas Geological Society. He succeeds H. A. Hemphill of Midland.

Other officers elected were W. C. Fritz, of Skelly Oil Co., as vice president, and Jess Simmons, of Continental Oil Co., as secretary-treasurer.

Ballots are being prepared for the naming of a representative from the South Permian Basin chapter to the American Association of Petroleum Geologists. Cary P. Butcher, Tide Water Oil Co., is the retiring representative. Three persons have been nominated, Ronald DeFord, Argo Oil Co.; Vaughan C. Maley, Humble Oil & Refining Co., and James Fitzgerald, Jr., Skelly Oil Co. The representative will be named at the A.A.P.G. meeting in Oklahoma City, March 22-24.

Wage Earners in Refineries Increased During 1937

The average number of wage-earners employed in oil refineries in 1937 was 83,183, compared with 77,402 in 1936, according to a preliminary report by the United States Census Bureau released through the American Petroleum Institute. Total wages paid in 1937 were $140,414,750, or almost $30,000,000 in excess of the total of $109,610,774 in 1936. Wages averaged $1,688 for each employe in 1937, against $1,416 in 1936.

Lexicon of Geologic Names

The U. S. Geological Survey, Department of the Interior, has recently published as Bulletin 896, a Lexicon of Geological Names of the United States in two volumes. These books have been compiled by M. Grace Wilmarth, and represent several years' work. Definitions contained in the Lexicon state briefly the lithology, thickness, age, underlying and overlying formations, and type locality. The two volumes sell for $2.50 and may be obtained from the Superintendent of Documents, Washington, D. C.

New Mexico Map

A new map of the state of New Mexico showing oil and gas fields with principal highways and railroads has just been published by Zingery Oil Map Co., Fair Building, Fort Worth, Tex.

THREADS—
DEEP—SHALLOW—STANDARD

—are easily produced with "TOLEDO" Adjustable Pipe and Bolt Die Heads.

Simple, positive adjustment of 4 to 5 turns on pipe and 1/64" on bolts. Loosen 4 cover screws and turn knurled ring until desired size is reached.

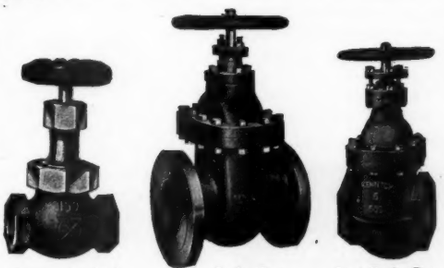
Dies can be reground or replaced at small cost. All segments cut equal even when standard setting is changed.

For repair work and where threads must be hidden, these "TOLEDO" heads are of real value.

Any combination furnished. Ratchet handle or two handle stock if desired. Your dealer can supply you or write us for further details.

THE TOLEDO PIPE THREADING MACHINE CO.
TOLEDO, OHIO NEW YORK OFFICE AND DISPLAY, 72 LAFAYETTE ST.
"TOLEDO"

KENNEDY....



Heavy Standard Bronze Globe Valve

Iron Body Gate Valve 400-lb. Test Press.

Iron Body Gate Valve—1000-lb. Test Press.

Iron Body Gate Valve 700-lb. Test Press.

Iron Body Gate Valve 1600-lb. Test Press.

for dependable valve service

with oil, gas, steam or water

KENNEDY Valves open and close easily and remain tight indefinitely. Their bodies and bonnets are sturdily proportioned, stems are of specially tough, strong metal, operating mechanisms are simple and positive, and stuffing boxes are generous and have high grade molded packing. You can always depend on Kennedy Valves to serve long and efficiently.

Obtainable from your supply house.

The Kennedy Valve Mfg. Co.
Elmira, N. Y.

Canadian Fields

(Continued from Page 95)

tion of crude, and that all waste gas should be put back in the field rather than transported to another field.

Far South Completion

In the southwest extension of the west flank producing area, D. & D. Oils No. 1, LSD 12, Section 9-18-2w5, finished at 7,400 feet after getting the Black lime at 7,385 feet. Tubing was run and the well started flowing by heads while swabbing, with indications of a good producer. It will probably be acidized before a definite production test is made. The completion extends the field half a mile south of Royal Canadian No. 1 and half a mile southwest of National Petroleum Corp. No. 2. National No. 2, LSD 14, Section 9-18-2w5, encountered faulting after getting a fair production in the upper lime; but there was no evidence of faulting in the D. & D. well, indicating good prospects for further drilling southwest of the Highwood River.

Turner Valley Completions

In Section 17-18-2w5, Extension Royalties No. 1, LSD 14, finished at 8,020 feet, produced through 2-inch choke at the rate of 2,256 bbls. a day, with gas-oil ratio around 1,200 cu. ft. and bottom hole pressure approximately 2,000 cu. ft. It was previously given two acid treatments of 6,000 and 10,000 gallons. Anglo-Canadian Oil Co. No. 3, LSD 10, same section, finished at 7,738 feet, 645 feet in the lime, started at 240 bbls. natural production, increasing to 314 bbls. Official test will be made after a series of light acid treatments.

Tests in the Lime

West of the proven field, Okalta Oil Co. No. 6, LSD 3, Section 30-18-2w5, previously plugged back to 10,024 feet after encountering salt water in the lower lime at 10,209 feet, has cemented an additional 30 feet to complete water shut-off. It will later test production from the upper porous horizon of the limestone.

In Section 32-18-2w5, Royalite Oil Co. No. 36, LSD 13-14, got the Madison limestone at 7,460 feet and cemented 8-inch casing at 7,480 feet. It has started drilling out cement.

In section 5-19-2w5, Royalite No. 37, LSD 11, got the lime at 7,193 feet and cemented at 7,213 feet. It is preparing to deepen.

North Turner Valley

In North Turner Valley, Home Oil Co. No. 2 Millarville, LSD 6, Section 33-20-3w5, finished 15 feet in the black lime at 8,495 feet, gave an open flow varying from 2,377 to 2,214 bbls. a day through 1-inch choke, on early official tests, after acid treatment of 3,180 gallons. Official allowable under the new restricted quota has been set at 276 bbls. Gas-oil ratio has declined from 1,270 to 1,025 feet per bbl. while bottom-hole pressure is 3,055 pounds with 2,390 pounds at 2,200 feet below sea-level horizon. It may be given further acid treatments in both upper and lower horizons.

The only other test actually drilling in North Turner Valley is Royalite Oil Co. No. 35, LSD 7, Section 27-20-3w5, a little over a mile southeast of Home-Millarville No. 2. Royalite No. 35 is sidetracking below 5,921 feet after cementing back from 6,377 feet.

Royalite Oil Co. has purchased 320 acres in North Turner Valley from Model Oils, Ltd. for 7,500 treasury shares; the holdings including LSD 15, Section 15-20-3w5 and LSDs 2, 3, 4, 5, 11, 12 and 13, Section 22-20-3w5. Acreage is south and east of Home No. 2 Millarville. Mar Jon Oil Co. of Vancouver, B. C., has secured 1,700 acres north and west of the Home well on a cash and royalty basis. East Crest Oil Co. has acquired a 40-acre tract less than a mile north and west of Home No. 2, and 2,360 acres on the Two Pine structure, a potential extension of the North Turner Valley structure some 10 miles northwest. Davolite Oil Co. ha secured 880 acres and Davies Petroleums 1,760 acres in North Turner Valley. It is expected that most of these companies will start drilling this spring. Home Oil Co. which holds some 10,000 acres, is planning two new tests.

West Flank Drilling

On the west flank of South Turner Valley, Calwin Royalties No. 1, LSD 15, Section 5-19-2w5, is entering the Benton formation below 1,789 feet. Winalta Royalties No. 1, LSD 1, same section, is below 1,205 feet.

In Section 6-19-2w5, East Crest Oil Co. No. 4, LSD 8, is below 5,317 feet and getting close to the cardium sandstone marker.

In Section 32-18-2w5, George Harris & Associates No. 2, LSD 15, is in the Benton formation below 1,729 feet. Oil Ventures No. 1, LSD 14, is below 1,879 feet. Valley Drilling Co. No. 1 British Colonial, LSD 5 is below 3,800 feet. Vantage Oils No. 1, S half, LSD 12, resumed from 175 feet with Union Drilling Co. handling the contract, and is below 338 feet.

In Section 20-18-2w5, York Oils, No. 2, LSD 6, is below 4,802 feet.

In Section 17-18-2w5, Anglo-Canadian Oil Co. No. 4, LSD 6, is below 1,095 feet. Anglo-Canadian No. 6, LSD 3, has cellar dug and is waiting for outfit from No. 3 producer.

In Section 9-18-2w5, George Harris & Associates No. 1, LSD 13, is in the Benton formation below 3,350 feet.

West of the main producing area, Anglo-Canadian Oil Co. No. 5, LSD 8, Section 31-18-2w5, is below 3,248 feet. Scottish Petroleums No. 1, LSD 16, Section 19-18-2w5, is in the lower Benton formation below 5,010 feet. Royalite Oil Co. No. 38, LSD 16, Section 8-18-2w5, is in the Benton below 4,658 feet.

Central Area

In the area west of the old Central Turner Valley naphtha field, Valley Drilling Co. No. 1, LSD 11, Section 7-19-2w5, is spudding. Valley No. 2 has location in LSD 14, same section. Locations are northwest of the Mercury-Miracle naphtha wells in Section 4-19-2w5.

Farther north, Davolite Oil Co. No. 1 has been spotted in LSD 10, Section 18-19-2w5.

In Section 31-19-2w5, Structure Oil & Gas Co. No. 1, LSD 7, finished in February, 1931, at 5,212 feet, is being deepened to the Black lime. Location was on the west side of the central naphtha area, and the test got the Madison at 4,733 feet but was not carried to the lower porous horizon. It started around 72 bbls. a day, dropping gradually to 77 bbls. a month in October, 1938. It was shot at 5,000 feet with 500 quarts without increasing production. After deepening, it will be cleaned and acidized.

East Side Drilling

On the Twin dome structure, northeast side of Turner Valley, Anglo-Canadian Oil Co. No. 1, LSD 7, Section 16-21-28w4, is below 4,499 feet.

On the New Valley, McLeod Oil Co. No. 1, LSD 4, Section 6-21-2w5, is preparing to resume from 8,450 feet.

Near De Winton, Marquis Oils is arranging for completion of Anglesey-Lakeview No. 1, LSD 1, Section 22-21-1w5, which has been standing for 10 years at 4,500 feet. Location is between the High River-Aldersyde development and Turner Valley, and the test was started by the Marquis of Anglesey in 1927. Drilling throughout was in post-Benton formations, with a show of heavy crude between 1,390 and 1,574 feet and three gas shows between 3,251 and 4,247 feet.

Northern Foothills

On the Grease Creek structure, Grease Creek-Northwest Co. No. 1, LSD 2, Section 13-29-7w5 is below 960 feet, after getting the cardium sandstone around 275 feet and encountering some gas shows around 920 feet.

On the Ram River structure, Ram River Oils No. 1, Township 38-12w5 is below 720 feet after coring an oil sand with some gas at 660 feet.

On the Pouce Coupe structure in the northern foothills west of Peace River, Guardian Oil Co. No. 1, Section 7-80-12w5, standing at 2,500 feet, is re-tubing boilers in preparation for resuming next spring.

On the Brazeau structure west of Edmonton, Home Oil Co. No. 1, LSD 16, Section 7-43-17w5, bottomed at 4,520 feet, is reaming and carrying 10-inch casing below 4,280 feet.

On the Clearwater structure, Altoba No. 1, Section 31-34-9w5, is testing production from a sand between 1,196 and 1,286 feet after running a packer and tubing. The crude is 39 gravity with no sulfur indicated and there is some gas.

Southern Foothills

On the Highwood-Sinclair structure southwest of Turner Valley, Green Valley Oils No. 1 Banner, LSD 6, Section 34-17-3w5 is below 6,731 feet, some 1,371 feet below the Madison contact. The lime is exceptionally hard, with only slight porosity. J. & J. Syndicate No. 1, LSD 9, Section 12-16-3w5, is working on derrick, and expects to spud about February 10.

On the Savannah Creek structure, Anglo-Canadian Oil Co. No. 1, Section 20-14-4w5, is standing at 64 feet.

In the Pincher Creek area, Anglo-Canadian Oil Co. No. 1 Castle River, LSD 4, Section 11-6-1w5, is below 5,043 feet.

Steveville Oil Show

In the Steveville area, about 140 miles east of Calgary, Anglo-Canadian Oil Co. No. 1, LSD 2, Section 13-21-12w4, got the limestone and cemented casing around 3,178 feet. Some oil and gas shows were met at the contact, and the hole will be deepened into the lime for commercial production. The shows indicate a heavier gravity product than the Turner Valley crude. Test is being drilled jointly by the Anglo-Canadian Co. and Petroleum Investments, Ltd.

The Anglo-Canadian Co. has taken over 20,000 acres from Altoba Agencies, Ltd. of Calgary, in the Steveville-Denhart area, and tentative location for a second test has been made about 7 miles southeast of No. 1, south of the Red Deer River.

Anaconda Oil Co. No. 1, LSD 15, Section 9-22-12w4, bottoming at 2,550 feet, is running 10-inch casing to shut off water encountered in the Bow Island sand.

Border Fields

On the Bridge Dome structure, southern Alberta, Anglo-Canadian Oil Co. No. 1 Milk River, LSD 10, Section 4-2-13w4, got the limestone high at 2,442 feet and is standing cemented.

In the Taber field, Noble Drilling Co. No. 1, LSD 14, Section 33-8-17w4, is working on derrick.

East Central Alberta

In the Ribstone field, East Central Alberta, Blackfoot-Ribstone Oils No. 1, LSD 7, Section 28-43-2w4, has shut down till the spring, after encountering oil shows at 2,034 feet.

Model Oils Operations

Model Oils, Ltd. of Calgary has dis-

(Continued on Page 113)

Seals quickly and positively.
Makes joints permanently leak-proof.
Will not "freeze," nor gall.
Forms elastic body which will not crack.
Permits easy breaking out of threaded joints.
Insoluble in petroleum products.
Unaffected by heat, up to 400 deg.
Readily applied by any field worker.
Sold in container sizes to fit your needs.

Patents Pending
Buy RECTORSEAL from your supply store

RECTOR WELL EQUIPMENT CO., INC.
HEADQUARTERS: Fort Worth, Texas. BRANCHES: Houston, Wichita Falls, Midland, Corpus Christi, Los Angeles, Tulsa, Shreveport, Casper.

REGISTERED PROFESSIONAL ENGINEERS
GAS AIR WATER
REPRESSURING
INSTALLATION OPERATION
PETROLEUM ENGINEER
JO H CABLE
WICHITA FALLS TEXAS
GAS MEASUREMENT PERMEABILITY
COMPRESSOR PLANTS POROSITY
BOTTOM HOLE PRESSURE SATURATION
GAS OIL RATIOS RECOVERABLE OIL
CONTROL OF FLOW THRU FORMATION
REGISTERED PROFESSIONAL ENGINEERS

WILDCAT OPERATIONS

CALIFORNIA

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S. T. R.	Depth	Status—
Richfield Oil, No. 1 Tinaquaic, Foxen Can., S. B.	36- 9-32	3,877	sd. sh. drlg.
Barnsdall Oil, No. 5 Magenheimer, Gato Ridge, S. B.	9- 8-32	3,035	redrlg. 2,980
United West. Oil, No. 1 Los Olivos, Santa Barbara	16- 7-30	3,270	redrlg. 3,249
Litho Oil, No. 1 R. I. E., Capitan, Santa Barbara	5- 4-30	363	sd. sh. drlg.
West. Oil Roy., No. 1 Brvce. Carpinteria, Santa B.	29- 4-25	376	sd. sh. drlg.
T.-O. Oil, No. 2 Mdivani, S. B. Mesa, Santa Barb.	28- 4-27	1,500	cleaning out
Garvin & Seaman, No. 1 Gauthier, Summerland, S.B.	22- 4-26	1,458	sd. sh. drlg.
Levesque, G. M., No. 1 Robertson, Ojai, Ventura	17- 2-18	1,271	idle
Claran Oil, No. 1 Hardison, Sespe, Ventura	22- 4-20	2,915	idle
Merchants Pet., No. 8 Hillside, Sespe, Ventura	1- 4-20	1,690	O.S. drlg.
Ivers, H. A., No. 14 Kentuck, Sespe, Ventura	1- 4-20	822	sd. sh. drlg.
St. Louis Oil, No. 1 Creek, Sespe, Ventura	1- 4-20	2,010	deepening
Section 20 Oil, No. 1, Sespe, Ventura	20- 5-19	2,520	gr. sd. drlg.
Texas Co., No. 136 Shiells, Shiells Canyon, Ventura	4- 3-19	2,955	pump 190 b.d.
El Rancho Oil, No. 2 Elkins, Shiells Canyon, Vent.	9- 3-19	2,006	sd. sh. drlg.
Continental Oil, No. 10 Grubb, San Miguelito, Vent.	24- 3-24	5,777	O.S. drlg.
C. C. M. Oil, No. 24-B Hobson, Rincon, Ventura	16- 3-24	3,660	gr. sd. drlg.
Tide Water A. O., No. 40 V.L.W., Vent. Ave., Vent.	25- 3-23	6,898	cmtd. 6,875
Tide Water A. O., No. 14 McGonigle, Vent. Ave., V.	23- 3-23	2,991	sd. sh. drlg.
Tide Water A. O., No. 123 Lloyd, Vent. Ave., Vent.	27- 3-23	5,570	cmtd. 4,695
Tide Water A. O., No. 128 Lloyd, Vent. Ave., Vent.	27- 3-23	9,570	hd. sh. drlg.
Tide Water A. O., No. 134 Lloyd, Vent. Ave., Vent.	27- 3-23	8,339	redrlg. 7,540
Tide Water A. O., No. 8 Hartman, Vent. Ave., Vent.	22- 3-23	4,480	sd. sh. drlg.
Shell Oil, No. 98 Taylor, Ventura Avenue, Ventura	21- 3-23	3,875	sd. sh. drlg.
Shell Oil, No. 33 Edison, Ventura Avenue, Ventura	28- 3-23	4,761	sd. sh. drlg.
Brit. Amer. Oil, No. 7 Bolsa, Ventura Ave., Ventura	22- 3-23	6,770	redrlg. 5,665
Alliance Pet., No. 3 Hisey, Ventura Ave., Ventura	21- 3-23	3,470	sd. sh. drlg.
Lloyd Corp., No. 2 Dabney, Ventura Ave., Ventura	23- 3-23	7,550	sd. sh. drlg.
Cal. Expl., No. 2 Occidental, Lost Hills, Kern	24-26-20	3,783	sd. sh. drlg.
Belridge Oil, No. 35-26-A, North Belridge, Kern	35-27-20	7,550	br. sh. drlg.
Belridge Oil, No. 26-25, North Belridge, Kern	26-27-20	8,500	tested wet
Belridge Oil, No. 26-39, North Belridge, Kern	26-27-20	5,172	br. sh. drlg.
Belridge Oil, No. 28-2, North Belridge, Kern	28-27-20	7,990	br. sh. drlg.
Tide Water A. O., No. 23-3, North Belridge, Kern	22-27-20	5,561	sd. sh. drlg.
Richfield Oil, No. 3, North Belridge, Kern	22-27-20	5,330	br. sh. drlg.
Amerada Pet., No. 6 Beer, Blackwells Cor., Kern	21-26-19	3,800	br. sh. drlg.
Emigrant Oil, No. 1 Den, Devil's Den, Kern	24-25-18	4,104	idle
Herzog, R. D., No. 1 Den, Devil's Den, Kern	27-25-18	430	sd. sh. drlg.
Shell Oil, No. 21 Freeman, Round Mountain, Kern	20-28-29	1,915	sd. sh. drlg.
Fuhrman, Alfred, No. 11-A Kern, Kern River, Kern	28-28-28	637	O.S. drlg.
Triad Oil, No. 1 A.H.S., Kern River, Kern	19-28-28	233	sd .sh. drlg.
Superior Oil, No. 1 Clerico, Magunden, Kern	26-29-28	2,893	sd. sh. drlg.
Shell Oil, No. 58-29 Glide, W. Mount Poso, Kern	29-27-28	1,687	sd. sh. drlg.
Richfield Oil, No. 1 Union Avenue, Kern	5-30-28	9,140	sd. sh. drlg.
O'Reily, F., No. 1 Berree, Edison, Kern	5-30-29	3,350	sd. sh. drlg.
Oils, Inc., No. 1 Cauley, Edison, Kern	16-30-29	4,276	cleaning out
Superior Oil, No. 1 Jewett, Arvin, Kern	16-31-29	3,090	sd. sh. drlg.
Texas Co., No. 35-1, KCL, Fruitvale, Kern	35-28-26	6,680	sd. sh. drlg.
Pacific Southwest Oil, No. 1 Dillon, Fruitvale, Kern	27-29-27	2,198	sd. sh. drlg.
Renner, G. E., No. 2 R.H.L., Sivert, Kern	27-30-30	2,600	will recmt.
Hillview Oil, No. 1 Tejon, Caliente Creek, Kern	11-30-30	2,384	hd. sd. drlg.
Continental Oil, No. 4-A, KCL, Wasco, Kern	8-27-24	10,471	sd. sh. drlg.
Standard Oil, No. 2 Mushrush, Wasco, Kern	7-27-24	10,034	sd. sh. drlg.
Standard Oil, No. 8-2-B, KCL, Wasco, Kern	17-27-24	6,480	hd. sh. drlg.
Cal. Lands, Inc., No. 1 Salisbury, Buttonwillow, Kern	7-29-24	11,550	sd. sh. drlg.
Union Oil, No. 7-34, KCL, Rio Bravo, Kern	34-28-25	11,452	flow 350 b.d.
General Pet., No. 3 Van Ness, Rio Bravo, Kern	2-29-25	10,310	sd. sh. drlg.
General Pet., No. 1 Caldwell, Rio Bravo, Kern	35-28-25	6,573	sd. sh. drlg.
Shell Oil, No. 23-2-A, KCL, Rosedale, Kern	2-29-26	1,784	sd. sh. drlg.
Standard Oil, No. 2 Fleishauer, Greeley, Kern	20-29-26	11,590	will recmt.
Standard Oil, No. 11-16, KCL, Greeley, Kern	20-29-26	10,030	gr. sh. drlg.
Standard Oil, No. 11-17, KCL, Greeley, Kern	18-29-26	7,692	sd. sh. drlg.
Standard Oil, No. 12-6, KCL, Greeley, Kern	30-29-26	7,380	sd. sh. drlg.
Standard Oil, No. 1 Ross, Greeley, Kern	20-29-26	8,109	will deepen
Standard Oil, No. 1 Elrich, Greeley, Kern	20-29-26	11,351	br. sh. drlg.
Superior Oil, No. 12, KCL, Greeley, Kern	3-30-26	11,622	gr. sd. drlg.
Shell Oil, No. 6-30-B, KCL, Ten Section, Kern	30-30-26	6,572	sd. sh. drlg.
Shell Oil, No. 61-14-A, KCL, Canal, Kern	14-30-25	7,098	sd. sh. drlg.
Shell Oil, No. 87-4-B, KCL, Canal, Kern	4-30-25	11,120	sd. sh. drlg.
Ohio Oil, No. 10-E, KCL, Canal, Kern	14-30-25	8,325	completing
Standard Oil, No. 1 Rio Bravo fee, Canal, Kern	12-30-25	8,280	swabbing
Union Oil, No. 1-11, KCL, Coles Levee, Kern	11-31-25	186	sd. sh. drlg.
Standard Oil, No. 20-1, KCL, Coles Levee, Kern	9-31-25	2,684	sd. sh. drlg.
Ohio Oil, No. 2-F, KCL, Coles Levee, Kern	10-31-25	8,280	sd. sh. drlg.
Wilbent Oil, No. 2 Royer, Midway-Sunset, Kern	7-11-23	4,443	idle
Honolulu Oil, No. 5-A Deep Test, Mid'y-Sunset, Kern	14-32-24	3,080	sd. sh. drlg.
Fried, Julius, No. 1 Fried, Midway-Sunset, Kern	34-32-24	5,035	redrlg. 4,550
National Oil, No. 32 Midway, Midway-Sunset, Kern	35-32-23	935	sd. sh. drlg.
Standard Oil, No. 7-30 Western, McKittrick, Kern	7-30-22	2,203	O.S. drlg.
Standard Oil, No. 7-31 Western, McKittrick, Kern	7-30-22	2,050	rigging up
Westco Pet., No. 1 West, McKittrick, Kern	34-30-22	5,846	fish D.P.
Hall-Baker Co., No. 1 Williams, McKittrick, Kern	2-30-21	2,481	br. sh. drlg.
Tide Water A. O., No. 2 S.P., Tejon Ranch, Kern	15-11-19	7,153	hd. sh. drlg.
Petrol Corp., No. 33-5 Reserve, Tejon Ranch, Kern	33-11-19	7,530	basalt; drlg.
Progressive Oil, No. 3, East Coalinga, Fresno	20-19-15	790	br. sh. drlg.
Foreign Oil, No. 6 Annex, W. Coalinga, Fresno	6-21-15	1,170	bl. sh. drlg.
Gen. Pet., No. 103 Esperanza, W. Coalinga, Fresno	6-20-15	1,318	sd. sh. drlg.
Jarvis, L. F., No. 2 Leo, W. Coalinga, Fresno	14-20-14	473	sd. sh. drlg.
Amerada Pet., No. 7-17-S.P.L., N. Coalinga, Fresno	17-19-16	3,984	sd. sh. drlg.
Petseahon, No. 37-7-F, Southeast Coalinga, Fresno	7-20-16	7,401	flow 3,000 b.d.
Petseahon, No. 71-18-F, Southeast Coalinga, Fresno	18-20-16	7,751	O.S. drlg.
Standard Oil, No. 71-13-C fee, S.E. Coalinga, Fresno	13-20-15	733	cmtd. 628
Standard Oil, No. 1-17-F, fee, S.E. Coalinga, Fresno	17-20-16	8,015	O.S. drlg.
Superior Oil, No. 3 fee, S.E. Coalinga, Fresno	7-20-16	5,880	sd. sh. drlg.
M. C. A. Drlg., No. 1 Adams, Kreyenhagen, Fresno	33-22-16	820	sd. sh. drlg.
K. N. D. A., No. 54-24-H, Kettleman North, Fresno	24-21-16	9,574	sd. sh. drlg.
K. N. D. A., No. 6-16-Q, Kettleman North, Kings	16-22-18	8,190	gr. sd. drlg.
K. N. D. A., No. 36-18-Q, Kettleman North, Kings	18-22-18	5,688	sd. sh. drlg.
K. N. D. A., No. 36-22-Q, Kettleman North, Kings	22-22-18	7,460	flow 4,143 b.d.
K. N. D. A., No. 78-22-Q, Kettleman North, Kings	22-22-18	7,320	gr. sd. drlg.
Standard Oil, No. 46-13-H, Kettleman North, Fresno	13-21-16	11,030	P.B. 10,684
Standard Oil, No. 56-1-P, Kettleman North, Kings	1-22-17	6,770	br. sh. drlg.
Standard Oil, No. 76-7-Q, Kettleman North, Kings	7-22-18	6,754	br. sh. drlg.
Cal. Pet. Prod., No. 1 Irons, Cuyama, S. L. Obispo	19-10-24	1,830	cmtd. 1,500
Epco, Inc., No. 1 Ajax, Union, San Luis Obispo	27-26-13	4,272	sd. sh. drlg.

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S. T. R.	Depth	Status—
Antelope Valley Oil, No. 1 Palmdale, Los Angeles	17- 6-12	1,209	sd. sh. drlg.
Mojave Pet., No. 1 Hillsdale, Gorman, Los Angeles	5- 8-18	510	idle
Texas Co., No. 1 Anderson, Ocean Park, Los Angeles	17- 2-15	7,285	redrlg. 6,200
Rolling Hills Pet., No. 1 Weston, Palos Verdes, L. A.	27- 4-14	5,198	sd. sh. drlg.
A. T. Oil, No. 3 Lomita, Torrance, Los Angeles	23- 4-14	2,787	sd. sh. drlg.
Alford Oil, No. 1 Lomita, Torrance, Los Angeles	23- 4-14	286	sd. sh. drlg.
Anderson Oil, No. 1 Lomita, Torrance, Los Angeles	23- 4-14	3,180	sd. sh. drlg.
Bolling Oil, No. 1 Power, Torrance, Los Angeles	23- 4-14	5,166	sd. sh. drlg.
Cinco Oil, No. 1 Woodruff, Torrance, Los Angeles	23- 4-14	3,600	rigged up
Campeet Oil, No. 17-A Kleinmyer, Torrance, L. A.	23- 4-14	3,856	will deepen
Cuba Oil, No. 1 Lomita, Torrance, Los Angeles	23- 4-14	4,861	sd. sh. drlg.
H. D. Oil, No. 1 Lomita, Torrance, Los Angeles	23- 4-14	3,807	rigged up
Hunt. Signal Oil, No. 1 Clarke, Torrance, L. A.	23- 4-14	5,140	O.S. drlg.
Kern Pet., No. 1 Neher, Torrance, Los Angeles	23- 4-14	3,776	sd. sh. drlg.
Kovell Oil, No. 1 Deep Hole, Torrance, Los Angeles	23- 4-14	5,160	O.S. drlg.
Lebow, C. H., No. 1 fee, Torrance, Los Angeles	23- 4-14	5,168	flow 660 b.d.
Maldum Pet., No. 4 Lomita, Torrance, Los Angeles	23- 4-14	5,131	O.S. drlg.
Maldum Pet., No. 5 Lomita, Torrance, Los Angeles	23- 4-14	1,184	sd. sh. drlg.
McCaslin, W. E., No. 1 Springman, Torrance, L. A.	23- 4-14	4,892	sd. sh. drlg.
Pacific West. Oil, No. 12 Marble, Torrance, L. A.	15- 4-14	3,740	will deepen
Pacific West. Oil, No. 13 Marble, Torrance, L. A.	15- 4-14	4,782	sd. sh. drlg.
Paso Oil, No. 1 Lyle, Torrance, Los Angeles	22- 4-14	5,128	cleaning out
Standard Oil, No. 1-2 Marble, Torrance, L. A.	15- 4-14	4,800	flow 936 b.d.
Tiger Oil, No. 1 Lomita, Torrance, Los Angeles	23- 4-14	5,137	O.S. drlg.
Westside Oil, No. 3 Exeter, Torrance, Los Angeles	23- 4-14	5,139	flow 140 b.d.
Wilson, Ray, No. 2 Lomita, Torrance, Los Angeles	23- 4-14	5,098	O.S. drlg.
Whit. S. F. S. Synd., No. 2 Lomita, Torrance, L. A.	23- 4-14	2,994	sd. sh. drlg.
C. C. M. O., No. 41, Torrance, Los Angeles	14- 4-14	3,740	will deepen
C. C. M. O., No. 51, Torrance, Los Angeles	14- 4-14	4,740	sd. sh. drlg.
C. C. M. O., No. 12 Kettler, Torrance, Los Angeles	14- 4-14	3,825	rigged up

KEY TO ABBREVIATIONS USED IN DRILLING REPORTS

Abd., abandoned.
Acd., acidized.
B.O., barrels of oil.
B.P.D., barrels per day.
B.D., barrels daily.
B.P., back pressure.
B.R., building rig.
Br. sh., brown shale.
B.S., basic sediment.
C.&P., cellar and pits.
Cd. or Crd., cored.
C.D., corrected depth.
Cg., coring.
Cmtd., cemented.
C.O., cleaning out.
Comp., completed.
Compr., compressor.
C.P., casing pressure, also cement through perforations.
Csg., casing.
D.D., drilling (or drilled) deeper.
Drlg. or Drg., drilling.
Drk. or Dk., derrick.
D.S., drill stem.
D.&A., dry and abandoned.
Fsg., fishing.
Gbo., gumbo.
G.I., gas injection.
Gr., gravity.
Gr. sd., gray sand.
Grn. sh., green shale.
Hd. sd., hard sand.
H.F.W., hole full of water.
I.P., initial production.
L., lime.
L.D.D., later drilled deeper.
Lnr., liner.
Loc., location.
M.I.M., moving in material.
M.I.R., moving in rig.
M.I.R.T., moving in rotary tools.
M.O.T., milling on tools.
O.I.H., oil in hole.
O.S., oil sand.
O.T.D., old total depth.
O.W.D.D., old well drilling deeper.
O.W.P.B., old well plugging back.
P.B., plugging or plugged back.
P.B.P., pulling or pulled big pipe.
P.L., pipe line.
P.L.O., pipe line oil.
Pmpg., pumping.
P.O.P., putting on pump.
P.P., pulling pipe.
Rd. sd., red sand.
Rd. sh., red shale.
Recmt., recemented.
Rmg., reaming.
Redrlg., redrilling.
Rng., running.
R.O.G., rig on ground.
R.P., rock pressure.
R.U., rigging up.
R.U.R., rigging up rotary.
R.U.S.T., rigging up standard tools.
R.&T., rods and tubing.
S. or Sd., sand.
S.D., shut down.
Sdy. sh., sandy shale.
Sdtr., or St., sidetracking.
S.D.P.L., shut down for pipe line.
S.D.O., or S.D.W.O., shut down awaiting orders.
S.G., show gas.
Sh.&L., shale and lime.
S.I., shut in.
S.I.P., shut in, prorated.
S.L.M., steel line measurement.
S.O., show oil.
S.O.G.&W., show of oil, gas and water.
Spdg., or Spd., spudding.
S.R., straightreaming.
Stdg., standardizing (also standing).
S.W., salt water.
Swbg., swabbing.
T.A., temporarily abandoned.
Tbg., tubing.
T.D., total depth.
T.P., tubing pressure.
Tr., tract.
U.R., underreaming.
W.I.H., water in hole.
W.O., workover.
W.O.C. or W.O.C.S., waiting on cement to set.
W.P., working pressure.
W.S.O., water shutoff.
W.S.S.O.K., water shut off O.K.
W.S.R. or W.O.S.R., awaiting standard rig.
Wtr., water.

General Pet., No. 13 Poggi, Harbor City, L. A.	30-	4-13	2,894	sd. sh. drlg.
Texas Co., No. 3 Oakley, Harbor City, Los Angeles.	30-	4-13	3,985	sd. sh. drlg.
Union Oil, No. 66 Callender, Dominguez, L. A.	33-	3-13	430	sd. sh. drlg.
Union Oil, No. 49 Hellman, Dominguez, Los Angeles	33-	3-13	8,942	redrlg. 8,875
Shell Oil, No. 97 Reyes, Dominguez, Los Angeles ..	33-	3-13	8,255	O.S. drlg.
Bankline Oil, No. 2 Kirby, Rosecrans, L. A.	20-	3-13	5,194	sd. sh. drlg.
Union Oil, No. 28 Rosecrans, Rosecrans, Los Angeles	19-	3-13	6,386	sd. sh. drlg.
Universal Consd., No. 14 Trust, Rosecrans, L. A. ..	18-	3-13	7,760	flow 380 b.d.
Isco Pet., No. 2 Abel, Rosecrans, Los Angeles	19-	3-13	5,780	sd. sh. drlg.
Superior Oil, No. 12 Maxwell, Rosecrans, L. A.	19-	3-13	8,852	P.B. 7,696
Hydrocarbon Prod., No. 1 Duchess, Rosecrans, L. A.	19-	3-13	7,815	flow 570 b.d.
Basin Oil, No. 4 Club, Potrero, Los Angeles	34-	2-14	2,379	sd. sh. drlg.
Barnsdall Oil, No. 5 R.S.F., Newhall, Los Angeles ..	26-	4-17	5,174	sd. sh. drlg.
Standard Oil, No. 1 Ward, Aliso Canyon, L. A.	27-	3-16	1,190	sd. sh. drlg.
Tide Water A. O., No. 2 Porter, Aliso Canyon, L. A.	27-	3-16	966	sd. sh. drlg.
Union Oil, No. 1-27 Orcutt, Aliso Canyon, L. A.	27-	3-16	958	sd. sh. drlg.
Mojave Pet., No. 2 Jennings, Newhall, Los Angeles	33-	5-14	500	idle
Mangrum & Page, No. 1 Lintz, Newhall, Los Angeles	4-	3-15	212	sd. sh. drlg.
General Pet., No. 22 Harbor, Wilmington, L. A. ...	2-	5-13	2,645	O.S. drlg.
General Pet., No. 32 Harbor, Wilmington, L. A. ...	2-	5-13	2,510	sd. sh. drlg.
General Pet., No. 12 S.P., Wilmington, Los Angeles	2-	5-13	3,620	sd. sh. drlg.
Allied Pet., No. 30 Harbor, Wilmington, L. A.	35-	4-13	3,341	flow 200 b.d.
F. A. Pet., No. 1 Franco, Wilmington, Los Angeles	29-	4-13	3,580	sd. sh. drlg.
McCloskey, E. F., No. 1 Padreson, Wilmington, L. A.	32-	4-13	2,716	sd. sh. drlg.
Richfield Oil, No. 31 P.D., Wilmington, L. A.	2-	5-13	3,175	O.S. drlg.
Union Pacific R. R., No. 99, Wilmington, L. A.	4-	5-13	2,828	O.S. drlg.
Union Pacific R. R., No. 12-E, Wilmington, L. A. ..	34-	4-13	3,619	O.S. drlg.
Union Pacific R. R., No. 13-E, Wilmington, L. A. ..	34-	4-13	2,999	sd. sh. drlg.
Universal Consd., No. 7 Newport, Wilmington, L. A.	2-	5-13	2,690	sd. sh. drlg.
Grady, R. T., No. 1 Associates, San Pedro, L. A. ...	23-	5-14	614	cmtd. 415
Seacliff Pet., No. 1 Club, Montebello, Los Angeles .	3-	2-12	715	idle
Olympic Ref., No. 1 Smith, Montebello, L. A.	2-	2-12	7,136	sd. sh. drlg.
St. Helens Pet., No. 30 Monterey, Montebello, L. A.	2-	2-12	5,698	sd. sh. drlg.
St. Helens Pet., No. 4 Mulholland, Montebello, L. A.	2-	2-12	4,976	sd. sh. drlg.
Standard Oil, No. 2 Braun, Montebello, L. A.	2-	2-12	6,694	O.S. drlg.
Standard Oil, No. 4 Braun, Montebello, L. A.	2-	2-12	6,730	O.S. drlg.
Standard Oil, No. 5 Braun, Montebello, L. A.	2-	2-12	4,983	cleaning out
Standard Oil, No. 2 Kaufman, Montebello, L. A.	2-	2-12	4,994	sd. sh. drlg.
Standard Oil, No. 4 Harvey, Montebello, L. A.	2-	2-12	5,997	sd. sh. drlg.
Union Oil, No. 1 Calkins, Montebello, Los Angeles..	2-	2-12	7,160	O.S. drlg.
Union Oil, No. 4 Paul Howard, Montebello, L. A. ..	2-	2-12	2,994	sd. sh. drlg.
Union Oil, No. 4 Howard & Smith, Montebello, L. A.	2-	2-12	6,680	flow 790 b.d.
Union Oil, No. 3 Wilcox, Montebello, Los Angeles .	2-	2-12	5,297	sd. sh. drlg.
Union Oil, No. 30 La Merced, Montebello, L. A. ..	1-	2-12	5,690	sd. sh. drlg.
Stanley Oil, No. 1 Mont., Montebello, Los Angeles	2-	2-12	4,890	sd. sh. drlg.
Pongratz Oil, No. 1 Newmark, Montebello, L. A. ..	3-	2-12	5,499	sd. sh. drlg.
Texas Co., No. 5 Mulholland, Montebello, L. A.	2-	2-12	3,670	sd. sh. drlg.
Herley-Kelly, Inc., No. 2 Burke, Montebello, L. A...	2-	2-12	5,480	sd. sh. drlg.
H. & C. Oil, No. 1 Joyce, Whittier, Los Angeles ...	22-	2-11	3,270	sd. sh. drlg.
Texas Co., No. 6 Baldwin, Santa Fe Springs, L. A. ..	6-	3-11	6,739	swab water
Texas Co., No. 1-13-A Smith, Anaheim, Orange	8-	4-10	7,790	sd. sh. drlg.
Brea Canyon Oil, No. 49 Brea, Brea Canyon, Orange	2-	3-10	4,770	sd. sh. drlg.
Shell Oil, No. 20 Orange, Brea Canyon, Orange	2-	3-10	7,984	P.B. 7,185
Battersby, J. M., No. 1 Associates, Carmenita, Orange	21-	3-11	8,950	swab water
Goodrich Oil, No. 1 Paige, Richfield, Orange	22-	3- 9	3,160	rig to pump
Southwest Expl., No. 7 State, Hunt. Beach, Orange	3-	6-11	3,490	sd. sh. drlg.
Southwest Expl., No. 8 State, Hunt. Beach, Orange	4-	6-11	3,171	sd. sh. drlg.
Southwest Expl., No. 14 State, Hunt. Beach, Orange	10-	6-11	4,394	sd. sh. drlg.
Wilshire Oil, No. 2 H.B., Huntington Beach, Orange	10-	6-11	4,192	redrlg. 3,897
Wilshire Oil, No. 15 H.B., Huntington Beach, Orange	10-	6-11	4,559	redrlg. 3,860
Patos Drlg., No. 1 Graham, Sunset Beach, Orange ..	21-	5-11	3,591	sd. sh. drlg.
Shell Oil, No. 3 Irvine, Corona Del Mar, Orange ...	6-	7- 9	1,415	sd. sh. drlg.
Dauphin Dev., No. 1 Irwin, Ponto, San Diego	16-12-		4 806	idle
Palm City Oil, No. 1 Palm City, San Diego	21-18-		2 181	idle

KANSAS

Week Ending February 4 (Descriptions are East unless marked otherwise)

Barber County

Barbara Oil Co. No. 1 Wilson, C SE Sec. 17-33-13. Drlg. 850 ft.

Barton County

Amerada Pet. Co. No. 1 Kruckenberger, C NE NE Sec. 14-19-15w. Lans. 3,260 ft.; Arb. 3,572 ft.; T.D. 3,632 ft.; P.B. 3,595 ft.

Gulf Oil No. 1 Louis, C N½ NW SW Sec. 2-20-12w. Drlg. 2,707 ft.

Long & Johnson No. 1 Eveleigh, SW SW NE Sec. 3-18-14w. Lansing 3,100 ft.; Arb. 3,338 ft.; T.D. 3,367 ft.; acdz. twice and P. 10 B.O.P.H.

I. W. Murfin No. 1 Birzer, NE SW Sec. 21-19-11w. S.D. 2,250 ft.

Sinclair Prairie No. 1-A Pichner, NE SE SE Sec. 10-16-11w. Arb. 3,344 ft.; T.D. 3,371 ft.; P.B. 3,245 ft.; perf. and show wtr.

Butler County

Bowland & McCoy No. 1 Frankson, SE SW Sec. 2-29-6. Drlg. 165 ft.

Higgens & Pierce No. 1-A Shrieves, NE NW SE Sec. 2-26-4. S.D. 1,000 ft.

Cowley County

Barnsdall No. 1 Snodgrass, NW SE Sec. 36-30-6. C.O. 2,880 ft.

Brewer & Blair No. 1 Miller, NE NW NE Sec. 13-32-5. Bart. sd. 2,925 ft.; drlg. 3,074 ft.

Ben Gralapp et al No. 1-A Clark, NW NW NE Sec. 11-31-3e. T.D. 3,248 ft.

Phillips Pet. Co. No. 1 Bernard, SE SE NE Sec. 19-33-6. Drlg. 2,967 ft.

Dickinson County

Franks et al No. 1 Huffman, NW NW SW Sec. 11-13-1. Set 8-in. 1,884 ft.; C.O.

Ellis County

Bridgeport No. 1 Froelich, CWL SW Sec. 34-12-16w. Drlg. 1,900 ft.

C. L. Carlock No. 1 Philip, SE SW NE Sec. 10-15-17w. Lans. 3,028 ft.; Arb. 3,475 ft.; T.D. 3,520 ft.; H.F.W.; D.&A.

Darby Pet. No. 1 Peavey, NW NW NE Sec. 24-11-18w. T.D. 3,456 ft.; swb. 110 B.O. in 15 hrs.

Graham County

Continental Oil Co. No. 1 Drumm Comm. Co., SE SE NE Sec. 16-9-21w. Lans. 3,390 ft.; Arb. 3,684-99 ft.; drld. cmt.; S.S.O.

Continental Oil Co. No. 1 Putnam Inv. Co., CWL SW Sec. 3-9-21w. Drlg. 3,050 ft.

Greenwood County

Hancock et al No. 1 Rousch, C S½ SE NW Sec. 8-28-13. T.D. 1,530 ft.; S.D.

H. L. Turner No. 1 Black, SE NE NW Sec. 3-27-13. H.F.W. 1,895 ft.; D.&A.

Harvey County

Lanahan Drlg. Co. No. 1 Lagree, SE SE Sec. 4-23-3w. T.D. 280 ft.; S.D.; (last report).

Kingman County

Duwe & Farris No. 1 Kimminau, NE NW SW Sec. 12-30-9w. Set pkr. 4,450 ft.; 100,000 cu. ft. gas; Simp. 4,635 ft.; drlg. 4,719 ft.

Leavenworth County

John Hardaway No. 1 Scheller, SW SE SW Sec. 30-10-22. Drlg. 225 ft.

McPherson County

Marylyn Oil No. 1 Dixon, NW NE NW Sec. 7-19-2w. T.D. 3,018 ft.; pmp. 35 B.O. in 4 hrs.

Marion County

Cox & McGinnis and Saco Oil Co. No. 1 Jolliffe, C S½ SW SE Sec. 2-22-5. Drlg. 2,670 ft.

Johnson et al No. 1-A Miltz, SW SW SW Sec. 24-17-4. T.D. 2,485 ft.; est. 1 B. O.P.D.

Vickers Pet. No. 1 Sutphin, SW SE SW Sec. 30-22-4. Drlg. 1,650 ft.

Mead County

Pacific Midwest Oil No. 1 Rexford, NE SE SW Sec. 8-30-29w. S.D. 1,435 ft.

Osage County

J. M. Edwards No. 1 Detrick (O.W.D.D.), C NW SE Sec. 21-14-15. O.T.D. 1,200 ft.; S.D. 1,200 ft.

Ottawa County

Babcock Oil No. 1 Copeman, NW NW Sec. 18-10-2w. Miss. 2,835 ft.; H.F.W. 3,302-10 ft.; S.D. for csg. 3,480 ft.

Pratt County

Champlin Ref. Co. No. 1 Elliott, SW NE sec. 26-27-14w. Fsg. 4,857 ft.

Reno County

Barnsdall Oil Co. No. 1 Krehbiel, NE NE NE Sec. 18-25-5w. Drlg. 1,545 ft.

Rice County

Cities Service No. 1 DeWitt, CSL NE Sec. 33-19-9w. Arb. 3,174 ft.; T.D. 3,195 ft.; pmp. 513 B.O. in 8 hrs.; pot. 1,540 B.O.P.D.; grav., 49.6; comp.

Spurrier & Bruce No. 1 Cary, NE NW NW Sec. 30-18-8w. O.W.D.D.; O.T.D. 1,530 ft.; S.D. 1,680 ft.

J. H. Tatlock No. 1 L. C. Proffitt, SW SE SW Sec. 12-20-10w. Lansing 3,025 ft.; Arb. 3,327-3,335 ft., T.D.; P. 99 B.O. in 8 hrs.; pot. 298 B.O.P.D.; comp.

Rooks County

Phillips Pet. Co. No. 1 Tanzey, C NW SW Sec. 25-8-18w. Arb. 3,418-3,423 ft., T.D. 3,424 ft.; acd. and swb. 21 B.F.

Producers No. 1 Ham (O.W.D.D.), SW SW NW Sec. 25-7-19w. O.T.D. 1,800 ft.; Lans. 3,043 ft.; Arb. 3,350 ft.; T.D. 3,372 ft.; D.&A.

Russell County

K. F. Nelson No. 1 Polcyn, SW Sec. 31-13-15w. H.F.W. 3,389-91 ft.; T.D. 3,393 ft.; P.B. 3,164 ft.; drld. to 3,156 ft.; S.O.&G.

Phil-Han No. 1 Weimeister, SW Sec. 13-14-13w. Top pay 2,655 ft.; perf. and acd. and swb. ½ B.O.P.H.; to P.B.

R. H. Shields No. 1-A Gross, CSL SW SE Sec. 5-15-13w. Lans. 2,929 ft.; T.D. 2,976 ft.; P.B. 2,950 ft.

Saline County

Central States Oil Co. No. 1 Crawford, NW SW NE Sec. 26-13-3w. Drlg. 1,100 ft.

Sedgwick County

Century Pet. Co. No. 1 Wilke, SW SE SW Sec. 1-29-2. Drlg. 650 ft.

Frank Hudson et al No. 1 Fulton, NE SE Sec. 35-28-1e. S.D. 2,356 ft.

Shawnee County

W. M. McKnab No. 1 Fritz, SW SE NW Sec. 4-12-14. Drlg.

Stafford County

Continental Oil No. 1 Russell, SW SW NE Sec. 13-25-13w. Drlg. 2,012 ft.

Stanolind O. & G. Co. No. 1 Curtis, SE cor. Sec. 31-21-12w. Viola 3,544 ft.; Arb. 3,638 ft.; R.U.S.T. 3,640 ft.

Virginia Drlg. Co. No. 1 Schlockter-meyer, SE NW Sec. 7-21-11w. Drlg. 3,230 ft.

Wabaunsee County

Scheu & Tague et al No. 1 Aye, NW SW NW Sec. 10-12-8. S.D. 488 ft.

Woodson County

Roby et al No. 1 Meairs, SW SW NW Sec. 21-25-14. S.D. 400 ft.

M. J. Trott No. 1 Abbott, NW NE NE Sec. 21-25-14e. Drlg. 1,325 ft.

OKLAHOMA

Week Ending February 4

NORTHERN OKLAHOMA

Caddo County

Texas Co. No. 1 Smith, C NE NW Sec. 2-5-12w. T.D. 2,556 ft.; S.D.O.

Cleveland County

Burke-Greis No. 1 Alberts, SE SW NW Sec. 19-7-1w. Hunton 6,885 ft.; Viola 7,320 ft.; Dense 7,390 ft.; drlg. 7,628 ft.

English Drlg. Co. No. 1 Rice, C NE NE Sec. 3-10-2w. Drlg. 960 ft.

Harper, Turner et al No. 1 Taylor, SE NE NW Sec. 23-8-2w. Drlg. 7,085 ft.

Nels-Burrton No. 1 Hirsch, NW NW NE Sec. 17-9-2w. O.W.P.B.; O.T.D. 7,692 ft.; T.D. 7,695 ft.; perf. 7,525-40 ft. in sd.; swbg. F., mostly wtr.

Garfield County

Champlin Ref. Co. No. 1 Allen, SE SE SE Sec. 26-24-8w. W.O.C. 6,385 ft.

Hughes Drlg. Co. No. 1 Meisner, C NE NW Sec. 10-20-4w. Viola 5,705 ft.; T.D. 5,755 ft.; perf. csg.

Garvin County

H. R. Hollenbach et al No. 1 Butterly, NE NE SE Sec. 22-1n-1e. 3,218,000 ft. gas; drlg. 3,205 ft.; S.D.; repairs.

Grady County

Carter Oil Co. et al No. 1 Smith C-58, C SE SW Sec. 26-5-8w. S.S.O. 5,329-58 ft.; S.O. 5,433 ft.; cd. 5,964-76 ft.; rec. sh.; cd. 6,351-76 ft.; rec. hd. sd.; T.D. 6,613 ft.; set 9-in. csg. 6,602 ft.; W. O.C.

Hughes County

Homer Doup et al No. 1 Bond, NE NE SW Sec. 7-7-9. S.D. 3,098 ft.

Skelton et al No. 1 Gilmore, C N½ NE SE Sec. 7-5-9. Drlg.

Jackson County

Lippert No. 1 Howard, NE SW NW Sec. 10-3-19w; O.W.D.D. T.D. 1,675 ft.; abd.

Kay County

Cooper Drlg. Co. No. 1 Caughlin, SE NE SW Sec. 30-25-1. Drlg. 135 ft.

Crawford No. 1 Boehi, SE SE NW Sec. 34-27-2w. T.D. 1,040 ft.; fsg.

C. C. Nye No. 1 Wolfenbarger, SW NW SW Sec. 16-27-4. T.D. 3,201 ft., sd.

Kaw Oil Co. No. 1 Wolfenbarger, NW NW SE Sec. 9-27-4. T.D. 60 ft.; S.D.; rprs.

Kingfisher County

Ace Gutowsky No. 1 Lankford, NE NE SE Sec. 34-17-6w. Drlg. 5,400 ft.

Kiowa County

C. J. Hagerling No. 1 Kimray, SW SW NW Sec. 36-5-18w. T.D. 407 ft.; S.D.

R. L. Emerson No. 1 Handcock, SE SE NE Sec. 26-6-15w. S.D. 520 ft.; mch. moved out.

Lincoln County

Fields & Nagle No. 1 Black, SE SE SE Sec. 31-16-6; O.W.D.D. T.D. 3,980 ft.; S.I.

Muskogee County

Heydrick No. 1 Paschall, NE SE NW Sec. 22-13-19. S.D. 1,446 ft.

Okfuskee County

Carter & Hight No. 1 Rogers, SW SW SW Sec. 6-13-8. T.D. 2,850 ft.; rng. 7-in. 2,482 ft.

I. T. I. O. No. 1 Palmer, NE SE NW Sec. 5-10-9. Drlg. 675 ft.

Okmulgee County

Jim Wise Drlg. Co. No. 1 Morrow, SW NW NE Sec. 16-15-13. 3,000,000 cu. ft. gas 1,930-38 ft.; decreased to 1,000,000 cu. ft. at 1,985 ft.; drlg. 1,986 ft.

Pawnee County

Ed Kelly No. 1 Hill, SW SW SE Sec. 1-21-5. Drlg. 1,656 ft.

Payne County

Comail Oil Co. No. 1 Curran, SE SE SE Sec. 21-19-6. Drlg. 2,000 ft.

Starr O. & G. Co. No. 1 Georgia, SE SW NE Sec. 35-18-4. 1st Wlx. 4,051 ft.; 2d 4,083 ft.; T.D. 4,123 ft.; P.B. 3,490 ft.; recmtd. 7-in.; drlg. plug.

Pittsburg County

Phillips Pet. Co. No. 1 Hubacker, C NW NE Sec. 11-7-5. Drlg. 2,790 ft.

Pontotoc County

J. L. Casey No. 1 Pace, SW SW NE Sec 14-2-7. H.F.W. at T.D. 1,614 ft.; D.&A.

H. Z. Moore No. 1 Payne, SE NW SE Sec. 16-4-4. T.D. 997 ft.; S.S.O.; S.D.

Union Dev. Co. No. 1-A Abbott, SW NW NE Sec. 34-3-6. S.D. 4,100 ft.

Pottawatomie County

Wood Oil Co. No. 1 Peters, SW SE NW Sec. 28-8-4. Wlx. 3,540 ft.; dolo. 4,365 ft.; T.D. 4,560 ft.; to perf. and test dolo.

Seminole County

Atlantic Ref. Co. No. 1 Atkinson, NW NW SW Sec. 17-6-6. Misener 3,697 ft.; Viola 3,718 ft.; T.D. 4,023 ft.; P.B. 3,819 ft.; W.O.C.

Lesslie Rogers No. 1 Kidd, NE SW SE Sec. 33-10-8. T.D. 200 ft.; S.D.

H. S. Moss No. 1 Leachman, C N½ SE NE Sec. 34-10-6. Drlg. 3,030 ft.

W. C. Wood No. 1 Aldridge, SW NW NE Sec. 5-8-8. Set 8-in. 2,854 ft.

Sequoyah County

Thompson Brs. No. 1 Ruby, NW NW NE Sec. 30-12-22. Drlg. 510 ft.

Stephens County

Phillips Pet. Co. No. 1 Culbertson, NW NW SE Sec. 4-1-5w. Drlg. 4,189 ft.

Texas County

Republic Nat. Gas Co. No. 1 Dulabohn, C Sec. 21-6n-15ecm. Drlg. 2,365 ft.

Republic Nat. Gas Co. No. 1 Judd, CSL SW Sec. 24-6n-15ecm. T.D. 2,870 ft.; gas 7,100,000 ft.

Washita County

Continental Oil Co. No. 1 Proctor C NW Sec. 28-10-20w. T.D. 10,195 ft.; heavy drk. completed; rmg. 9,429 ft.

L. B. McWhirter No. 1 fee, NW SW SW Sec. 34-8-19w. T.D. 2,190 ft.; S.D.

SOUTHERN OKLAHOMA

Carter County

Pure Oil Co. No. 1 Noble, NE SE Sec. 35-3s-1e. Woodford 4,289 ft.; Hunton 4,638 ft.; drlg. 4,744 ft.

Choctaw County

Clyde Ross et al No. 1 Hardy, SE SE NW Sec. 21-7s-15. Drlg. sd. 1,406 ft.

Jefferson County

Bridwell Oil Co. No. 1-I Seay, SE NE SW

Sec. 29-6s-5w. T.D. 1,519 ft., sd.; pmp. 15 B.O. and 100 B.W.; comp.
H. W. Weir No. 1 Carmichael, NE NE SW Sec. 23-7s-7w. W.O.C. 102 ft.

Marshall County

Hughes et al No. 1 Vittitto, C NE SE Sec. 11-5s-4e. O.W.D.D.; O.T.D. 7,100 ft.; fsg. csg.

Tillman County

Smith No. 2 Hammel, NE NW NW Sec. 6-5s-15w. T.D. 2,380 ft.; recvd. D.P. and S.D.

ARKANSAS

Calhoun County

J. E. Murdock No. 1 Southern Craft Corp., SE cor. NW NW Sec. 17-14-13. Top Nac. 2,372 ft.; top Tokio 2,920 ft.; S.D. 3,291 ft.; arng. resume drlg.

Columbia County

Atlantic Ref. Co. No. 1 A. S. Crisp, NW cor. NW NE Sec. 23-17-20. 16-in. csg. 121 ft.
Atlantic Ref. Co. No. 1-B Garrett, C NW NW Sec. 24-17-20. M.I. rig.
W. L. Goldston No. 1 A. C. Garrett, C SE SW Sec. 13-17-20. Set 16-in. 134 ft.; 10¾-in. csg. 2,227 ft.; drlg. rd.&gr. sh. 6,417 ft.
Pet. Finance Co. No. 1 Garrett, C SW SW Sec. 13-17-20. M.I. rig.
Alice Sydney Oil Co. No. 1 Crisp, Sec. 23-17-20. 16-in. csg. 127 ft.; drlg. ch. 2,370 ft.
Southwood Oil Co., Inc., No. 1 J. O. Hutcheson, C NE SW Sec. 14-17-20. Drlg. rd.&gr. sh. 6,475 ft.
Southwood Oil Co., Inc., No. 2 J. O. Hutcheson, C SE SW Sec. 14-17-20. 16-in. csg. 135 ft.; W.O.C.
Standard Oil Co. of La. No. 3 Crone, SW cor. NE SW Sec. 8-16-22. Arng. core 7,241 ft.
Standard Oil Co. of La. No. 1 Lewis Unit, SE cor. NW NE Sec. 15-17-19. P.B. 6,394 ft.; W.O.C.

Craighead County

Tannark, Inc., No. 1 Ruby M. Martin, 580 ft. NL, 80 ft. EL, Sec. 35-14n-3e. Fsg. for bit 1,735 ft.

Hot Spring County

John H. James No. 1 Sturgess Lbr. Co., SW cor. SW SE Sec. 24-6-18 10-in. csg. 58 ft.; S.D. for core bbl. 964 ft.

Lafayette County

Shell Pet. Corp. and Ohio Oil Co. No. 1 Warren, C SE SE Sec. 13-16-24. 13⅜-in. 194 ft.; 9⅝-in. 2,272 ft.; T. Bknr. 6,920 ft.; D.S.T. 7,169-7,228 ft.; shwd. S.W. and oil; tstg.; set 7-in. csg. 7,169 ft.; T. L. 7,165 ft.; T. por. L. 7,173 ft.; wtr. contact 7,186 ft.; T.D. 7,225 ft.; D.S.T. 7,155-7,220 ft.; tstd. mud; no S. O., G. or wtr.; swbd. S.W. with rainbow oil; 150 ft. F.I.H., 95% wtr.; cd. 7,220-7,318 ft.; soft ool. L. cores below 7,288 ft. showed salty taste; tight por. ool. L. 7,337 ft.; no show.
Wadley-Erwin et al No. 1 G. W. Taylor, C NE SW Sec. 15-19-26. 13⅜-in. csg. 447 ft.; T. anhy. 5,322 ft.; T. massive anhy. 5,495 ft.; T. Hill sd. 5,845 ft.; cd. 5,850-70 ft.; rec. 14 ft. fine por. gr. sd.; no show and 4 ft. 9 in. bl. sh.; cg. 6,102 ft.

Little River County

Barbee et al No. 1 Ada Mills, SE cor. NW NW Sec. 18-12-29. R.U.
C. & M. Drlg. Co. No. 1 Strawn, SW cor. SE Sec. 20-10-32. Cd. 1,270-80 ft.; sh.& wtr. sd.; S.D.; W.O.
Harford Oil Corp. No. 1 Pinning, C NE NE SW Sec. 6-13-30. S.D.; W.O. 1,925 ft.
Joe G. Strahan et al No. 2 Dierks Lbr. Co., Sec. 21-12-28. S.D. 3,661 ft.

Lonoke County

Carlisle Oil Dev. Co. No. 1 Walthour-Flake, NW cor. Sec. 10-1n-7w. Drlg. bl. sh. 985 ft.
Lonoke-Prairie Dev. Co. No. 1 T. Young, C NW NW Sec. 8-3n-7w. Hole clean; U.R. 8¼-in. csg. 236 ft.
W. L. Tedford No. 1 Anderson, 8-in. 400 ft.; arng. run 5-in. csg. on pkr. to shut off wtr. flw.; drlg. wtr. sd. 944 ft.

Miller County—Rodessa

Gerhig Co. No. 4 Mitchell, SE SW Sec. 2-20-28. R.U.
Gerhig Co. No. 2 Watson, NE cor. N SE Sec. 2-20-28. Drlg. sh. 1,620 ft.
Gulf Ref. Co. No. 5 Johnson, SW cor. Sec. 29-15-15. R.U.
Lyons & Merritt No. 1 Matlock, SE cor. Sec. 2-20-28. Drlg. sh. 2,790 ft.
Normandie Oil Co. No. 1 Watson, 330 ft. S and E, C Sec. 2-20-28. Comp.; 24 B. P.H.; ¼-in. ck.; C.P. 600 lbs.; 5½-in. csg. 6,190 ft.; (cor.); T.D. 6,210 ft.
Normandie Oil Co. No. 2 Watson, NE SE Sec. 2-20-28. R.U.
Mrs. S. O. Thompson No. 1 Gen. Am. Life Ins. Co., SE cor. SE SW Sec. 20-14-26. Cd. 3,657 ft.; slightly por. sdy. L.; D.S. stk.; T.D. 3,825 ft.; D.S.T. 3,677-95 ft.; tstd. 15 thribbles S.W.; 8 min.; S.D.; W.O.; 3,851 ft.

Mississippi County

Benedum & Trees Oil Co. No. 1 Mack, 330 ft. SW cor. NW SW Sec. 2-15n-12e. Top Nac. 2,160 ft.; set 7-in. csg. 2,897 ft.; drlg. very hd. gr. L. 4,030 ft.

Nevada County

Benedum & Trees Oil Co. No. 1 T. Erby, SW cor. SW SW Sec. 3-14-20. 10-in. csg. 100 ft.; cd. sd. 2,120-21 ft.; 7-in. csg. 2,120 ft.; drlg. plug 2,121 ft.
Webb & Franks No. 1 P. T. Grayson, SW cor. NW SE Sec. 4-14-20. Tokio sd.; D.S.T. 2,098-2,102 ft.; 10 min.; rec. 200 ft. oil and mud; open ck.; set 7-in. csg. 2,099 ft.; T.D. 2,102 ft.; W.O.C.
Texas Canadian Oil Co. No. 3 Stocks, C SW NE Sec. 9-15-22. 10-in. csg. 20 ft.; 7-in. csg. 1,341 ft.; T. Nac. 1,183 ft.; ripped csg. 1,190-96 ft.; bld. S.S.O.; W. O.S.R.; T.D. 1,204 ft.

Ouachita County

Deep Rock Oil Corp. No. 1 C. Wesson, SE cor. NE Sec. 23-15-19. Set 13-in. csg. 350 ft.; cd. T. C. V. 4,305 ft.; T. Buckner 5,700 ft.; T. Smkvr. 5,923 ft.; por. L. 5,934 ft.; T.D. 6,003 ft.

Union County—Schuler

E. M. Jones No. 1 J. C. Morgan, SE NW Sec. 13-18-18. Set 16-in. 144 ft. and 10¾-in. csg. 2,154 ft.; fsg. 7,435 ft.
E. M. Jones No. 2 J. C. Morgan, SE cor. NE NW Sec. 13-18-18. Drlg. sdy. sh. 6,525 ft.
Lion Oil Ref. Co. No. 2 Henry, C N SE SE Sec. 12-18-18. R.U.&S.D.
C. H. Murphy et al No. 2 fee, NW cor. SW SE Sec. 13-18-18. T. Jones sd. 7,558 ft.; T. por. L. 7,683 ft.; set 7-in. csg. 7,643 ft.; perf. 7,587-7,612 ft.; tstg.; T.D. 7,700 ft.; comp.; 150 B.P.D.; 10/64-in. ck.; T.P. 800 lbs.; C.P. 1,250 lbs.
Phillips Pet. Co. No. 1 Amanda, SE cor. NE SE Sec. 12-18-18. T. Jones sd. 7,548 ft.; T.D. 7,720 ft.; 7-in. csg. 7,697 ft.
Roberts & Murphy No. 3 Leona, NW cor. Lot 6, SW Sec. 7-18-17. Drlg. rd. &gr. sh. 5,900 ft.

Union County—Other

Ark. Southern Oil Corp. No. 3-A Simmons, NW cor. NE NW Sec. 15-18-13. O.W.D.D. Graves sd. 2,612-29 ft.; tstd. gas; P.B. to Nacatoch sd.; S.D. 2,629 ft.; W.O.
J. R. Lockhart No. 1-A Raulston, NE cor. SW SE Sec. 12-17-14. D.S.T. 3,007-37 ft.; ¼-in. B. and ½-in. T cks.; W.P. 100 lbs.; 3 min.; W.P. 210 lbs.; 9 min.; rec. drlg. mud and cut oil; rng. 7-in. csg. 3,037 ft.; tstd. S.W.; W.O.
J. R. Lockhart No. 3 Raulston, SE cor. NE SE Sec. 12-17-14. 10-in. csg. 105 ft.; W.O.C.
Mullins & Brooks et al No. 1 Nash, 500 ft. N and 338 ft. W of SE cor. NW SE Sec. 7-17-13. 10-in. csg. 148 ft.; D.S.T. 3,037-52 ft.; rec. 250 ft. oil and 30 ft. S.W.; 14-min.; W.P. 4 lbs.; top pay 3,232 ft.; 5½-in. 3,100 ft.; drld. out to 3,069 ft.; perf. 3,022-44 ft.; tstd. S.S.O.&G. and S.W.; reperf. 3,020-44 ft.; swbd. 100 B.P.D. for 3 days; W.O. S.R. 3,232 ft.
Mullins, Brooks et al No. 2 Nash, NE cor. NE SW Sec. 7-17-13. 10-in. 148 ft.
Sklar Oil Corp. No. 10 Murphy, SW NE Sec. 9-16-15. R.U.
Sloan Wells, Tr., No. 4 G. J. Childs, 150 ft. NW cor. NE SW Sec. 8-16-16. O.W. W.O.; O.T.D. 2,656 ft.; S.D.; W.O.

NORTH MISSISSIPPI

Calhoun County

L. C. Lucas No. 1 E. C. Boland, 400 ft. E and 500 ft. S, NW cor. SW Sec. 9-22n-9e. S.D. 791 ft.

Clarke County

Jeremiah L. Ryan et al No. 1 M. Eddins, 500 ft. SE cor. Sec. 29-2n-14e. S.D. 290 ft.

Hinds County

G. Jefferys No. 1 Gaddis Farms, Inc., NW cor. SE Sec. 26-7n-4w. S.D. 3,448 ft.
Cleve Love et al No. 1 S. F. Johnson, NE cor. Sec. 29-6n-1w. S.D. 5,218 ft., sd.; arng. D.D.

Montgomery County

Dr. T. H. Chichester No. 1 Mitchell, Sec. 36-20n-7e. Drk.

Pontotoc County

Waldrop et al No. 1 Bray, Sec. 17-11s-1e. S.D. 310 ft.

Simpson County

Cleve Love No. 1 N. E. Garner, SW cor. SW NE Sec. 1-10n-17w. S.D. 900 ft.
Goodwill O. & G. Co. No. 1 Berry, Sec. 33-2n-4e. S.D. 2,810 ft.

Yalobusha County

Chas. W. Crader et al No. 1 John Bruce Jane, 990 ft. NE cor. Sec. 24-11s-6w. Top chk. 1,565 ft.; S.D. 3,195 ft.

FLORIDA

Levy County

Florida Oil Discovery No. 2 Cedar Key Co., Sec. 9-15s-13e. S.D.; W.O.; T.D. 4,092 ft.

Nassau County

St. Mary Oil Corp. No. 1 Hillard, Sec. 19-4n-24e. Drilling at 4,375 feet.

Lake County

Union O. & R. Co. No. 1 Gulf Explns., Sec. 17-24s-25e. S.D. 235 ft.

Suwanee County

J. W. Phillips Oil Explin. Co. No. 1 Shilkett, Sec. 14-4s-14e. Drlg. 150 ft.

LOUISIANA

N. LOUISIANA WILDCATS

Bienville Parish

Ark. La. Gas Co. No. 2 Gayoso, 660 ft. SW cor. SE Sec. 14-16-10. T. Tr. Pk. 5,432 ft.; D.S.T. 5,796-5,805 ft.; tstd. dry in 26 min.; drlg. sdy. sh. 5,854 ft.

Bossier Parish

Premier Inv. Co. No. 1 McDade, SE SW NE Sec. 28-19-11. T.D. 2,384 ft.; acd. with 1,000 gal.; csg. seat gave away; hole full S.W.; 5½-inch csg., 2,342 ft. pmpg. 5 B.O.P.D. and 25 bbls. S.W.; arng. dpn. 2,432 ft.

Caddo Parish

P. T. Alexander No. 1 fee, NE cor. SE Sec. 1-20-16. Drlg. 650 ft.
R. E. Allison No. 3 Ellerbe, NE cor. Sec. 28-18-14. Loc.
Claude Bagley No. 1 Crystal fee, NE SW Sec. 24-21-16. Set 6-in. csg. 996 ft.; T.D. 1,003 ft.; tstd. S.W.; S.D.; W.O.
R. L. Bauman No. 1 Dorian, SE cor. NE Sec. 34-18-14. Set 9⅝-in. csg. 1,443 ft.; W.O.C.
J. M. Buckler No. 2 Stiles, NE cor. Sec. 17-21-16. R.U.
Burnham Drlg. Co. No. 1 Gray, 330 ft. S and E, C Sec. 34-22-16. R.U.
Carney et al No. 3 Hart, SE NW Sec. 21-21-16. Set 8-in. csg. 1,563 ft.; tstg. 1,839 ft.
Paul Cooper No. 2 Stiles, SW SE Sec. 28-21-16. Set 6-in. csg. 1,542 ft.; used 1,500 gal. acd. and tstd. dry; tstd. S.O 1,851 ft.; drlg. to 1,977 ft.; tstd. S.W.; W.O.
Cryer & Davis No. 1 Crystal fee, S and W, C Sec. 25-21-16. R.U.
L. L. Davidson No. 4 Muslow, NE SE Sec. 26-21-16. T.D. 2,257 ft.; W.O.S.R.
J. P. Driscoll et al No. 1 Woolworth, SE cor. Sec. 26-20-15. Set 16-in. csg. 208 ft.; W.O.O.
Driscoll Drlg. Co. No. 1 Muslow, NE cor. Sec. 9-20-15. Rng. csg. 1,310 ft.
Claude Ferguson No. 3 Lawhon, SW SE Sec. 7-20-15. Set 7-in. csg. 1,355 ft.; comp.; flwg. by hds. est. 90 B.P.D., T.D. 1,580 ft.
Claude Ferguson No. 4 Lawhon, NE cor. Sec. 7-20-15. 10-in. csg. 108 ft.; 7-in. csg. 1,348 ft.; acdzd. with 4,000 gal.; T.D. 1,589 ft.; tstg.
H. C. Prod. Co. No. 1 Kinnebrew & Ratcliff, NE cor. Sec. 5-19-16. D.S.T. 2,-253 ft.; S.W.; 7-in. csg. 1,497 ft.; will P.B.; T.D. 2,253 ft.
Harry Hanbury No. 1 Sample, C SW SE Sec. 23-18-14. Drlg. sh.&L. 3,895 ft.
Hurricane Pet. Corp. No. 1-C Chandler, C SW SE Sec. 34-18-14. 13⅜-in. csg. 316 ft.; W.O.C.
Hurricane Pet. Corp. No. 1 North, NW cor. SE NE Sec. 34-18-14. Set 9⅝-in. 1,637 ft.; sat. L. 5,528-44 ft.; rng. csg. 5,591 ft.
R. O. Kniveton No. 1 Kahn, NW cor. Sec. 35-18-14. Drlg. sh.&L. 5,450 ft.
La. Oil Prod. Co. No. 15-B Muslow, Sec. 4-20-15. Set 7-in. csg. with 4½-ft. perf. on bttm. at 2,148 ft.; W.O.S.R.
Wm. C. Leisk No. 1 Sinclair, NW SE Sec. 26-18-14. R.U.
Ben Levy No. 1 Crystal fee, SW cor. Sec. 25-21-16. Set 6-in. 1,350 ft.; tstd. dry 1,650 ft.; W.O.
C. D. Loe No. 1 Meyer, SE cor. Sec. 33-18-14. Top Pettit 5,592 ft.; T.D. 5,628 ft.; perf. 5,602-25 ft. and tstd. S.W.; P.B. 5,611 ft.; 5½-in. csg. 5,627 ft.; T. D. 5,631 ft.; P.B. 5,583 ft.; drld. out to 5,610 and perf. 5,602-05 and tstd. S.W.; perf. 5,553-57 ft.; tstd. csg. and perf. 5,-592-95 ft. Set tbg. with packer 5,600 ft. tstd. S.W. and S.O. 5,592-98 ft. and reperf. 5,589-92 ft.; set pkr. 5,587 ft. and tstd. S.W. 5,600 ft.; S.O.; S.D.; W.O.; T.D. 5,598 ft.; O.T.D. 5,631 ft. set retainer plug 5,603 ft. and sqzd. perf. points and reperf. 5,590-5,600 ft.; tstd. oil; no S.W.; swbd. dry; S.O.; used 500 gal. acd.; flwd. by heads, est. 5 B.P.H.; 50% S.W.; ¼-in. ck.; stopped flwg.; drld. out cmt. to 5,631 ft.; sqzd. off all perf.; set ret. plug 5,600 ft. and swbg. to test S.O.&S.W. 5,590-5,600 ft.
Magnolia Pet. Co. No. 5 Caddo Lve. Bd., NE cor. Sec. 7-20-15. T.D. 1,562 ft.; acdzd. with 3,000 gal. and tstg.
L. H. Mahon No. 1 Henderson, SW cor. Sec. 27-22-16. D.S.T. 2,465-80 ft.; flwd. oil in 5 min.; will set csg. 2,480 ft.
Manziel et al No. 3 Ramsey, NE SE Sec. 32-21-15. Set 5½-in. csg. 1,348 ft.; acd. with 2,000 gal. at 1,580 ft.; W.O.S.R.
Oils, Inc., No. 1 Cazaux, SW cor. Sec. 10-16-13. O.W.W.O.; O.T.D. 3,500 ft.; wash to bttm., 3,500 ft.; abd.
Sam Ripps No. 1 Chew-Lvy. Bd., Sec. 23-21-16. 8-in. csg. 1,025 ft.; tstd. S.W.; abd. 1,037 ft.
Southern Star Pet. Corp. No. 1 Muslow, SE NW Sec. 17-20-15. Pmpd. S.W.; O.T.D. 1,698 ft.; S.D. 2,150 ft.
J. O. Whittington No. 1 Grayson, C SE SE Sec. 30-19-15. Set 9⅝-in. csg. 2,-200 ft.; drlg. sh.&sd. 2,915 ft.
R. W. Williams No. 3 Ark. Fuel, SW cor. NW SW Sec. 25-21-16. R.U.

Caldwell Parish

G. W. Ziegen et al No. 15 Cent. La. Lbr. Co., 1,650 ft. S, 330 ft. E, NW cor. Sec. 32-15-2e. S.D. 1,653 ft.

Claiborne Parish

E. T. Oakes et al No. 2 Kilgore, C NW SE Sec. 28-21-5. Hd. to slightly por. L. 5,294-5,303 ft.; 5½-in. csg. 5,287 ft.; used 6,000 gal. acd.; swbg. to test; tstd. S.S.O. 5,324 ft.; split csg. 2,600 ft.; cmtd. csg.; swbd. dry; set tbg. with pkr.; cannot cmt. off S.W.; T.D 5,234 ft.; set 4½-in. csg. 5,290 ft.; tstd. dry; S.O. 5,324 ft.; used 5,000 gal. acd.; reacidized 2,000 gal. acd.; testg.; S.S.O. 5,324 ft.

De Soto Parish

S. S. Alexander No. 1-A Stoll, Sec. 5-12-16. Set 7-in. csg. 2,705 ft.; acd. with 3,000 gal. and tstd. est. 2,000,000 ft gas; 400 lbs.; D.S.T. 2,984-3,046 ft.; tstg. 165 ft. mud cut with oil, 35 min.; set short string 5-in. csg. on bttm.; T.D. 3,145 ft.
Paul Miller No. 2 Jal Drlg. Co., NE Sec. 5-11-11. Set 7-in. csg. 4,038 ft.; perf. 3,901-14 ft.; C.I.; W.O. ga.; R.P. 1,400 lbs.; O.T.D. 4,205 ft.; perf. csg. 3,901-14 ft.; C.I.; W.O. ga.; R.P. 1,400 lbs.

La Salle Parish

Alfred Black, Tr., No. 1 Wright, Sec. 35-10-1e. R.U.
G. C. Walsenham No. 1 Dean, NW cor. SE Sec. 23-9-1e. 6-in. csg. 1,595 ft.; tstd. S.W.; S.O.; sd. 1,602-05 ft.; T.D. 1,654 ft.; W.O.

Natchitoches Parish

Jack Lent et al No. 1 Whatley, SW cor. Sec. 17-10-10. S.O.&G. reported at 1,-490-1,516 ft.; T.D. 1,516 ft.; D.S.T. 1,-470-56 ft.; tstd. dry in 20 min.; did not set csg.; D.S.T. 2,069-96 ft.; rec. 180 ft. mud and sl.; S.O. and 900 ft. S.W. in 15 min.; drlg. hd. sd. 2,280 ft.

Red River Parish

Crow Drlg. Co. No. 1 Crichton, 990 ft. S and E, C Sec. 17-13-10. Set 4½-in. csg. 2,540 ft.; T.D. 2,562 ft.; perf. 2,-505-39 ft.; W.O.S.R.
J. C. Prine No. 3 Haynes, SW cor. Sec. 20-13-10. 5¾-in. csg. 2,510 ft.; D.D. 2,-560 ft.; W.O.S.R.
H. B. Schumacher No. 1 Crichton, SW cor. NW Sec. 18-13-10. Set 8-in. csg. 1,065 ft.; W.O.C. 1,365 ft.
D. J. Simmons et al No. 1 Richardson, NE cor. Sec. 24-13-11. Drlg. sh. 212 ft.

Sabine Parish

Clyde Creighton No. 1 Bowman Hicks, C NE NW Sec. 3-7-12. 10-in. csg. 60 ft. 7-in. csg. 2,422 ft.; W.O.S.R.; T.D. 2,-618 ft.
Earl F. Fox No. 1 Cook Ld. Co., SW cor. SE NW Sec. 1-9-12; O.W.W.O. O.T.D. 3,655 ft.; arng. dpn. 3,655 ft.
A. B. House No. 1 Sabine, NW NW Sec. 23-7-14. 8-in. csg. 2,134 ft.; used 7,000 gal. acd.; tstd. dry; cond. mud 3,642 ft.; arng. set 7-in. 3,500 ft.; T.D. 3,642 ft.
Hunter Co. No. 8 Bowman Hicks, C NE NW Sec. 13-7-13. Set 6-in. csg. 2,126 ft.; drlg. ch. rk. 2,310 ft.
LeGrande & Brown No. 1 Tatum, NE cor. NW NE Sec. 17-8-13. Tstd. dry 2,-130 ft.; tstd. S.G.; acd. with 1,000 gal.; tstd. dry 2,340 ft.; did not acd.; tstd. S.W.; S.O. 2,340 ft.; 500 ft. O.I.H.; used 3,000 gal. acd.; tstd. S.O. 2,340 ft.; will set short string 4-in. csg. 2,-340 ft.; W.O.S.R.; 800 ft. O.I.H.
H. L. Nutting No. 1 Williams, SW cor. Sec. 13-7-11. T.D. 3,130 ft.; used 3,000 gal. acd.; swbg. S.W. 2,860 ft.; will P. B. 2,755 ft.; tstd. S.W.; P.B. 2,730 ft.; acdz.; tstd. S.W.; S.O. 2,730 ft.; S.D.; T.D. 2,730 ft.
Major Oil Co. No. 1 Long Bell, SW cor. SW SE Sec. 1-7-13. 7-in. csg. 2,142 ft.; drlg. ch. rk. 2,250 ft.
W. L. Posey et al No. 3 Hale, NW cor. NW Sec. 12-7-13. 7-in. 2,090 ft.
C. H. Smith No. 1 Sabine Lbr. Co., NE cor. NW NW Sec. 9-7-13. Set 10-in csg. 66 ft.
Sutton Zwolle Oil Co. No. 2 Sabine, NW cor. NE NW Sec. 23-7-14. 8⅝-in. 2,-125 ft.

Tensas Parish

H. V. Schumacker No. 4 Mound Plantation, Sec. 29-11-12e. Rmg. to bttm.; T. D. 2,450 ft.; S.D. for D.S.T. 2,450 ft.

Webster Parish

R. L. Fisher et al No. 1 S. P. D. Coyle, 660 ft. N and 1,880 ft. E of SW cor. Sec. 23-21-10. Holly. sd. 5,544-59 ft. and 5,809-16 ft.; set 5½-in. csg. 5,782 ft.; T.D. 5,998 ft.; tstd. S.G.; swbd. S.O.& G.; flwg. 10 B.P.D. by hds. with input gas; tstg.

Hunt Oil Co. No. 4 Bodcaw-Stewart, 2,155 ft. N and 660 ft. E, SW cor. Sec. 34-21-10. Holly. sd. 5,821-47 ft.: set 9⅝-in. csg. 5,802 ft.; tstd. S.O.&G. in Hollwy. sd.; drlg. sdy. sh. 6,797 ft.

Hunt Oil Co. No. 5 Bodcaw-Stewart, NW cor. NE Sec. 33-21-10. Drlg. sh.&L. 4,150 ft.

Hunt Oil Co. No. 1 Sandifer, C NE NE Sec. 4-20-10. No Hollwy. sd.; top "D" sd. 8,534 ft.; S.O. 8,534-50 ft.; "D" sd. 8,537-68 ft.; Bodcaw sd. 8,628-68 ft., set 7-in. csg. 8,715 ft.; perf. csg. 8,540-65 ft. and tstd. S.W.; tstd. dry 8,538-40 ft., 8,540-42 ft., 8,542-44 ft., and 8,544-46 ft.; perf. again at 8,543-46 ft.; tstd. dry 8,543-46 ft.; sqzd. off perf.; reperf. 8,660-68 ft.; comp.; 12 B.P.H. dist. and 1,152,000 cu. ft. gas daily; T.P. 1,450 lbs.; C.P. 2,200 lbs.; T.D. 8,670 ft.

Hunt Oil Co. and Stanolind O. & G. Co. No. 1 Coffee-Webster Inv. Co. Unit, C NE NW Sec. 36-31-10. 13⅜-in. csg. 677 ft.; no Holly. sd.; set 9⅝-in. csg. 5,780 ft.; drlg. sh.&sd. 7,514 ft.

Hunt Oil Co. No. 5 Webb, 75 ft. W. C SE NE Sec. 14-21-16. Drlg. sh.&L. 5,045 ft.

Magnolia Pet. Co. No. 4 Branton, NE cor. Sec. 6-22-9. 9⅝-in. csg. 5,933 ft.; T. lower Marine 7,750 ft.; T. Bodcaw sd. 8,193 ft.; T. Davis 8,442 ft.; show some heavy oil at 8,450 ft.; drlg. hd. sd. 9,118 ft.

Magnolia Pet. Co. No. 1 Cox. C NW SW Sec. 15-21-10. Set 13⅜-in. csg. 847 ft.; drlg. sh. 5,873 ft.

Magnolia Pet. Co. and Ohio Oil Co. No. 1 Coyle-Hodges Unit, SW cor. NW Sec. 21-21-10. Drlg. anhy.&sh. 4,495 ft.

Magnolia Pet. Co. No. 1 Roseberry Unit, 20 ft. N and W, C SE Sec. 29-23-9. Set 13⅜-in. csg. 887 ft.; T. Pettit L. 5,725 ft.; S.O. 5,764-66 ft.; T. Tr. Pk. 5,900 ft.; set 9⅝-in. csg. 5,962 ft.; drlg. sh.&sd. 7,454 ft.

Ohio Oil Co. No. 5 Bodcaw Acct. 4, NW SE Sec. 13-21-10. O.W.W.O.; killed to recomp.; S.D. 7,774 ft.

Ohio Oil Co. No. 7 Merritt, NE cor. Sec. 14-21-10. Set 13⅜-in. csg. 806 ft.

Oliphant Oil Corp. No. 1 Gray & Stephens, C SE SW Sec. 35-21-10. Top Tr. Pk. 5,882 ft.; Hollwy. sd. 5,975-88 ft.; 9⅝-in. csg. 5,595 ft.; "D" sd. 8,397-8,420 ft.; oil; Bodcaw sd. 8,487-8,535 ft.; gas; set 7-in. csg. 8,594 ft.; perf. 8,397-8,420 ft.; comp.; 135 B.P.H. of 45-grav. oil through 16/64-in. ck.; T.P. 1,825 lbs.; C.P. 8,040 lbs.; T.D. 8,597 ft.

Oliphant Oil Corp. No. 1-A Hodges, C NW NE Sec. 3-20-10. Top Tr. Pk. 5,995 ft.; no Holl. sd.; set 9⅝-in. csg. 5,610 ft.; drlg. sh.&sd. 7,758 ft.

Oliphant Oil Corp. No. 2-B Stewart, C NW NW Sec. 4-20-10. No Hollwy. sd.. 9⅝-in. csg. 5,615 ft.; top "D" sd. 8,594 ft., S.W.; T. Bodcaw 8,684 ft.; 7-in. csg. 8,672 ft.; tstd. S.O.&G. and S.W. 8,692 ft.; D.S.T. failed; used 2,000 lbs. input gas and tstd. 55 bbls. dist. and 103 bbls. S.W. per day; tstd. dry 8,715 ft.; Bodcaw sd. 8,683-8,732 ft.; Davis sd. 8,929-9,198 ft.; S.W. and abd. 9,198 ft.

Stanolind O. & G. Co. and W. Delaney No. 1 Pardee-Coffee Unit, C NE Sec. 36-21-10. T. Tr. Pk. 5,932 ft.; no Holloway sd.; set 9⅝-in. csg. 5,955 ft.; drlg. sh.&sd. 7,841 ft.

Union Prod. Co. No. 1 Walker Unit, 50 ft. S. C SE Sec. 30-18-8. Set 9⅝-in. csg. 6,490 ft.; T. Pettit 6,665 ft.; T. Tr. Pk. 6,910 ft.; drlg. sh.&sd. 7,090 ft.

Woodley Pet. Co. No. 1 J. O. Couch, C NW SW Sec. 36-21-10. T. "D" sd. 8,450 ft.; rec. 10 ft. sd. sat. with oil; "D" sd. oil sat. 8,445-69 ft.; Bodcaw sd. showed oil 8,583-97 ft.; set 7-in. csg. 8,583 ft.; T.D. 8,600 ft.; W.O.C.

SOUTH LOUISIANA FIELDS

Abbeville—Vermilion Parish

Continental Oil Co. No. 1 Franciol, Sec. 67-12s-3e. Drk

Bancroft—Beauregard Parish

Republic Prod. Co. No. 4 Columbia Ld. & Tbr. Co., Sec. 16-6s-13w. T.D. 7,335 ft.; 7-in .csg. 7,317 ft.; perf. csg. 7,288-90 ft.; tstd. S.W.; perf. csg. 7,288-90 ft.; I.P. 265 B.P.D.; ¼-in. ck.

Republic Prod. Co. No. 6 Columbia Ld. & Tbr. Co., Sec. 15-6s-13w. R.U.

Republic Prod. Co. No. 4 Lutcher Moore Lbr. Co., Sec. 16-6s-13w. Drk.; (cor.).

Republic Prod. Co. No. 5 Lutcher Moore Lbr. Co., Sec. 15-6s-13w. Drlg. sh. 3,051 ft.

Republic Prod. Co. No. 1 Louis Whitman, Sec. 15-6s-13w. T.D. 7,344 ft.; S.D.

Bateman Lake—St. Mary Parish

Texas Co. No. 2 State-Bateman Lake, Sec. 21-16s-12e. R.U.

Baton Rouge—East Baton Rouge Parish

Geo. Helis et al No. 1 McInnis, Sec. 36-8s-1w. Loc.

Wm. Helis No. 5 Duplantier, Sec. 65-7s-1w. Top sd. 6,451 ft.; T.D. 6,475 ft.; 7-in. csg. 6,460 ft.

Wm. Helis et al No. 3 Harry B. Nelson, Sec. 36-7s-1w. 10¾-in. csg. 2,072 ft.; T.D. 6,476 ft.; top sd. 6,455 ft.; 7-in. csg. 6,459 ft.

Bayou Blue—Iberville Parish

Humble O. & R. Co. No. 3 Schwing Lbr. Co., Sec. 66-9s-11e. T.D. 8,090 ft.; abd.

Bayou Bouillon—St. Mary Parish

Transcontinental Oil Co. No. 5 State, Sec 13-9s-9e. T.D. 1,275 ft.; 10¾-in. csg. 1,170 ft.; T.D. 3,100 ft.; P.B. 1,700 ft.; prep. to sdtrk. 1,400 ft.; cd. oil sd. 3,360-80 ft.; 7-in. csg. 3,510 ft.; perf. csg. 3,366-82 ft.; tstd. 40,000,000 cu. ft. gas; S.I.

Bayou Choctaw—West Baton Rouge

La. Crusader No. 5 Schwing, Sec. 29-8s-11e. 9⅝-in. csg. 2,250 ft.; T.D. 4,755 ft.; P.B. 4,200 ft.; sdtrkd. 4,214 ft.; T.D. 7,878 ft.; P.B. 7,530 ft.; stk. D.S. P.B. 5,800 ft.; sdtrkd.; T.D. 5,890 ft.; P.B. 5,200 ft. to sdtrk.; drlg. sh. 6,018 ft.

La. Crusader No. 6 Schwing, Sec. 29-8s-11e. Drlg. sh. 4,285 ft.

Bayou Des Allemands—St. Charles Parish

Amerada Pet. Corp. No. 3 St. Charles Ld. Co., Sec. 13-15s-20e. Drlg. sd. 4,898 ft.

Amerada Pet. Corp. No. 4 St. Charles Ld. Co., Sec. 13-15s-2e. Loc.

Bay St. Elaine—Terrebonne Parish

Texas Co. No. 2 L.L.&E., Bay St. Elaine, Sec. 18-22s-18e. Drlg. sd. 4,611 ft.

Texas Co. No. 2-B State-Bay, Sec. 13-22s-17e. Drlg. sd. 4,666 ft.

Caillou Island—Terrebonne Parish

Texas Co. No. 4 State-Terrebonne Bay, Sec. 19-23s-20e. T.D. 6,463 ft.; P.B. 5,430 ft.; sdtrkd.; T.D. 6,774 ft.; abd.

Texas Co. No. 29 State, Sec. 17-23s-20e. Rig.

Cameron Meadows—Cameron

Burton-Sutton Oil Co. No. 26 Sch. Ld. Sec. 16-14s-13w. T.D. 2,465 ft.; 13⅜-in. csg. 2,465 ft.; T.D. 6,564 ft.; P.B.; sdtrkd.; drlg. sh. 5,419 ft.

Chacahoula—La Fourche Parish

Sun Oil Co. No. 5 Dibert, Stark & Brown Cypress Co., Sec. 70-15s-15e. 16-in. csg. 110 ft.; 10¾-in. csg. 1,865 ft.

Sun Oil Co. No. 4 Dibert Stark and Brown Cypress Co., Sec. 70-15s-15e. Drlg. sd. 7,644 ft.

Charenton—St. Mary Parish

Edwards & Aber No. 2 Blanchard, Sec. 21-13s-9e. T.D. 1,148 ft.; 5½-in. csg. 1,141 ft.; tstd. S.W.; P.B. 1,132 ft.; perf. csg. 1,125-32 ft.; W.O.S.R.

Kinsley Oil, Inc., No. 1-B Hertel, Sec 30-13s-9e Loc.

Pan American Prod. Co. No. 1 Achee, Sec. 21-13s-9e. Loc.

Pan American Prod. Co. No. 1 Law Realty, Sec. 31-13s-10e. T.D. 7,225 ft.; P.B. 6,480 ft.; abd.

Pan American Prod. Co. No. 4 South Coast Corp., Sec. 30-13s-10e. T.D. 3,019 ft.; abd.

Convent—St. James Parish

Continental Oil Co. No. 2 Realty Operators, Inc., Sec. 16. 13¾-in. csg. 492 ft.; T.D. 7,889 ft.; P.B. 7,275 ft.; to sdtrk.

Creole—Cameron Parish

Superior Oil Co. No. 5 State-Gulf of Mexico, Sec. 4-15s-8w. Drlg. sh. 2,425 ft.

Darrow—Ascension Parish

Humble O. & R. Co. No. 20 Community Sec. 30-10s-2e. 10¾-in. csg. 3,122 ft.; T.D. 7,480 ft.; abd.

Kiva Oil Co. No. 1 Duplessis, sec. 69-10s 2w. S.D. 2,523 ft.

Dog Lake—Terrebonne Parish

Texas Co. No. 22 State, Sec. 5-22s-16e. 13⅜-in. csg. 2,030 ft.; T.D. 6,027 ft., P.B.; sdtrkd.; T.D. 6,602 ft.; trying to sdtrkd. at 6,208 ft.; cg. sd. oil odor 6,843 ft.

Edgerly Field—Calcasieu Parish

R. H. Kean et al No. 1 M. J. Muller et al, Sec. 29-9s-11w. 7-in. csg. 2,804 ft.; bailed S.W.; S.D. 3,050 ft.

Fausse Point—Iberia Parish

Texas Co. No. 5 State Lake-Fausse Point, Sec. 35-11s-8e. Drlg. sdy. sh. 10,142 ft.

Garden Island—Plaquemines Parish

Texas Co. No. 31 State, Sec. 28-23s-33e. Drlg. sh. 6,369 ft.

Gillis—Calcasieu Parish

Union Sulphur Co. No. 12 State, Sec. 12-9s-8w. T.D. 9,070 ft.; P.B. 8,613 ft.; set retainer at 6,793 ft.; perf. csg. 6,780-90 ft.; I.P. 91 B.P.D. plus 24% S.W.

Golden Meadows—La Fourche Parish

Martex Pet. Corp. No. 1 Falgout Holding Co., Inc., Sec. 9-19s-22e. Drk.

Grand Bay—Plaquemines Parish

Gulf Oil Corp. No. 25-A Erwin, Sec. 13-12s-10w. Drk.

Gulf Oil Corp. No. 3 Grand Prairie, Sec. 6-20s-19e. 20-in. csg. 70 ft.; 13⅜-in. csg. 1,600 ft.; drlg. sd. 7,141 ft.

Gulf Oil Corp. No. 4 Grand Prairie Lve. Dist., Sec. 48-20s-18e. Loc.

Gulf Oil Corp. No. 2 State, Sec. 6-20s-19e. Loc.

Gueydan—Acadia Parish

A. M. Barbe No. 1 G. L. Humble, Sec. 27-11s-1w. T.D. 8,685 ft.; perf. csg. 4,490-96 ft.; tstd. S.W.; S.D.

Hackberry—Cameron Parish

F. W. Bennett No. 1 Bickford, Sec. 37 12s-10w. Drlg. sh. 5,902 ft.

L. W. Capps et al No. 1 Duhon, Sec. 27 12s-10w. T.D. 3,487 ft.; 7-in. csg. 3,271 ft.; P.B. 3,330 ft.; I.P. 16 B.P.D.; pmpg.

Gulf Ref. Co. No. 25-A Erwin, Sec. 13-12s-10w. Drlg. sh. 1,020 ft.

Stanolind O. & G. Co. No. 56 State, Kelso Bayou, Sec. 22-12s-10w. Drlg. sh 3,970 ft.

Superior Oil Co. No. 5 Benson Vincen Sec. 30-12s-10w. Drlg. sh. 8,059 ft.; 7-in. csg. 7,887 ft.; comp. for dry gas well.

Texas Co. No. 16-B State-Hackberry Twp. 12s-9w. T.D. 8,201 ft.; salt; 7-in. csg. 7,950 ft.

Texas Co. No. 24-B State, Sec. 12s-9w T.D. 8,052 ft.; sdtrkd.; T.D. 8,163 ft.; 7-in. csg. 8,050 ft.; perf. csg. 7,90 16 ft.; tstd. S.W.; P.B. 7,780 ft.; perf csg. 7,763-74 ft.; pmpd. 142 bbls. oil, 10% S.W.

Union Sulphur Co. No. 11 Doiron, Sec 37-12s-10w. Drlg. sd. 7,179 ft.

Union Sulphur Co. No. 12 Doiron, Sec. 37-12s-10w. R.U.

Union Sulphur Co. No. 45 Watkins, Sec. 13-12s-10w. Drk.

Horseshoe Bayou—St. Mary Parish

Texas Co. No. 2 State, Sec. 37-17s-9e 9⅝-in. csg. 11,631 ft.; T.D. 12,770 ft.; set 1,659 ft. of 6⅝-in. csg. at 12,645 ft.; lost D.S.; fsg.

Jeanerette—St. Mary Parish

Herton Oil Co. No. 1 Adeline Sugar Co. Sec. 39-13s-9e. Drlg. L. 10,340 ft.

Herton Oil Co. No. 9 Carter, Sec. 38-13s-9e. T.D. 10,431 ft.; abd.

Jefferson Island—Iberia Parish

Texas Co. No. 2 Jefferson Island, Sec. 58-12-5e. 18⅝-in. csg. 40 ft.; drlg. L.& sh. 6,985 ft.

Texas Co. No. 2 State-Lake Peigneur, Twp. 12s-5w. R.U.

Jennings—Acadia Parish

W. T. Burton No. 6 Roboria, Sec. 41-9s-2w. 7-in. csg. 6,721 ft.; fsg. tbg.; T.D. 6,997 ft.; sdtrkd. at 6,118 ft.; drld. to 6,178 ft.; sdtrkd. at 6,023 ft.; T.D. 6,732 ft.; trying to drill by fish; P.B. 6,104 ft.; W.O.C.; sdtrkd. 6,020 ft.; T.D. 6,056 ft.; 7-in. csg. 2,203 ft. and 10¾-in. csg. 2,108 ft.; sdtrkd.; drld into old hole; P.B.; sdtrkd. 2,302 ft.; drlg. sh. 5,621 ft.

A. W. Forrester No. 1 Jules Clement, Sec. 46-9s-2w. T.D. 3,060 ft.; abd.

Glassell & Glassell No. 5 McFarlain, Sec. 41-9s-2w. Drlg. sh. 1,601 ft.

Glassell & Glassell No. 6 McFarlain, Sec. 41-9s-2w. Drlg. sh. 3,285 ft.

Glassell & Glassell No. 7 Trushel, Sec. 42-9s-2w. T.D. 7,628 ft.; 7-in. csg. 7,624 ft.; perf. csg. 7,155-85 ft.; I.P. 514 B.P.D.; 14/64-in. ck.

Gulf Ref. Co. No. 1 Lamb, Sec. 45-9s-2w. T.D. 7,335 ft.; abd.

Jolly Pet. Co. No. 3 McFarlain, Sec. 41-9s-2w. T.D. 7,288 ft.; 7-in. csg. 7,178 ft. I.P. 730 B.P.D.; ¼-in. ck.

L. & L. Oil Co. No. 4 Houssiere Latreille, Sec. 47-9s-2w. 7-in. csg. 1,817 ft.; drlg. 1,881 ft.

Port City Oil Co. No. 23 Jennings Haywood, Sec. 41-9s-2w. T.D. 2,761 ft.; 7 in. csg. 2,300 ft.; perf. csg. 1,840-2,093 ft.; I.P. 200 B.P.D., 15% S.W.

Shell Pet. Corp. No. 1 Prather. Drlg. sdy. sh. 4,890 ft.

Stanolind O. & G. Co. No. 114 Crowley Oil & Mineral Co., Sec. 48-9s-2w. R.U.

Superior Oil Co. No. 16 Wm. Leckelt Sec. 42-9s-2w. Drlg. sh. 7,630 ft.

Lafitte—Jefferson Parish

Texas Co. No. 1 Sch. Bd., Sec. 16-17s-24e. 13⅜-in. csg. 2,030 ft.; T.D. 10,62? ft.; 9⅝-in. csg. 10,622 ft.; T.D. 11,961 ft.; well tried to blowout; stk. D.S.

Texas Co. No. 2 State-Bayou Norman, Sec. 21-17s-24e. Loc.

Lake Hermitage—Plaquemines Parish

Gulf Oil Corp.-Humble O. & R. Co. No 9 La Fourche Basin, Sec. 2-18s-25e. Drlg. sd.&L. 2,784 ft.

Lake Pelto—Terrebonne Parish

Texas Co. No. 22 State, Sec. 8-23s-18e T.D. 6,027 ft.; sdtrkd.; T.D. 5,388 ft.; 7-in. csg. 5,224 ft.

Leesville—La Fourche Parish

Lincoln Oil Co. No. 2 Visier, Sec. 26-21s-22e. T.D. 4,188 ft.; P.B. 3,660 ft.; prep. to pmp.

Texas Co. No. 7 Leeville, Sec. 27-21s-22e. T.D. 8,667 ft.; D.S. stk.; sdtrkd. T.D. 8,436 ft.; sdtrkd.; T.D. 8,685 ft. stk. 9⅝-in. csg. at 8,577 ft.; sdtrkd 8,440 ft.; stk. D.S.; sdtrkd.; drlg. sdy. sh. 9,708 ft.

Lirette—Terrebonne Parish

Humble O. & R. Co. No. 2 H. J. Ellender, Sec. 32-19s-19e. Drlg. sh. 7,810 ft.

Lake Long—La Fourche Parish

Fohs Oil Co. No. 7 State-Lake Long, Twp. 17s-19e. 18⅝-in. csg. 295 ft.; T. D. 10,248 ft.; 7-in. csg. 9,928 ft.; P.B. 9,875 ft.; perf. csg. 9,862-68 ft.; tstd. 780 lbs. press.; recvd. 270 ft. drlg. mud, cut with gas; perf. csg. 9,876-9,882 ft.; recvd. 30 ft. of gas-cut mud; sqzd. off perf.

New Iberia—Iberia Parish

Canal Oil Co. No. 5 Sabatier, Sec. 54-12s-7e. T.D. 2,504 ft.; run csg.

Wm. Helis No. 8 Bullock, Sec. 25-12s-7e. Drlg. sh. 1,127 ft.

Wm. Helis No. 5 Schwing, Sec. 56-12s-7e. T.D. 4,954 ft.; P.B. 4,188 ft.; W. O.C.

Texas Co. No. 2 Bryant, Sec. 25-12s-7e. R.U.

Texas Co. No. 1 DeCuir, Sec. 25-12s-7e. Drlg. sh. 3,728 ft.

Texas Co. No. 2 Gonsoulin, Sec. 13-12s-7e. Drlg. sh.&shlls. 5,340 ft.

Texas Co. No. 2-A Hanzon, Sec. 54-12s-7e. Drlg. sh. 5,267 ft.

Texas Co. No. 3-B Hanszen, Sec. 54-12s-7e. 7-in. csg. 6,838 ft.; cg. sd.&sh. 6,934 ft.

Texas Co. No. 1 Renaudet et al, Sec. 71-12s-7e. Drlg. sh.&L. 7,472 ft.

North Topetate—Acadia Parish

Atlantic Ref. Co. No. 1 Alcide Fournerat, Sec. 11-7s-2w. Cg. sh. 8,450 ft.

Atlantic Ref. Co. No. 3 Klumpp, Sec. 13-7s-2w. T.D. 8,700 ft.; 7-in. csg. 8,700 ft.; perf. csg. 8,469-75 ft.; I.P. 138 B. P.D.; ⅛-in. ck.

Port Barre—St. Landry Parish

Pan American Prod. Co. No. 5 Cormier, Sec. 4-6s-5e. T.D. 4,841 ft.; oil sd.

Pan American Prod. Co. No. 1 Rene Nezat. Drlg. sd.&sh. 4,717 ft.

Y. D. Spill No. 1 Gaudet, Sec. 4-6s-5e. S.D. 4,700 ft.

Potash—Plaquemines Parish

Humble O. & R. Co. No. 38 Orleans Lve. Dist., Sec. 13-18s-15e. Drk.

Western Gulf Prod. Co. No. 1 Paseale. Sec. 6-18s-27e. Loc.

Western Gulf Prod. Co. No. 1-A Treadway, Sec. 6-18s-27e. Loc.; (cor.).

Quarantine Bay—Plaquemines Parish

Gulf Oil Corp. No. 2-A Orleans Levee Bd., Sec. 7-19s-17e. 9⅝-in. csg. 5,660 ft.; T.D. 5,702 ft.

Gulf Ref. Co. No. 5 State, Sec. 17-19s-17e. Loc.

Gulf Oil Corp. No. 9 State QQ, Sec. 18-19s-17e. Loc.

South Houma—Terrebonne Parish

Shell Pet. Corp. No. 2 Peters. Drlg. sh. &L. 8,031 ft.

Raceland—La Fourche Parish

Amerada Pet. Corp. No. 1 Godchaux Sugars, Inc., Sec. 34-15s-19e. 18⅝-in. csg. 262 ft.; T.D. 11,312 ft.; 7-in. csg. 11,312 ft.; T.A.

Amerada Pet. Corp. et al No. 2 Godchaux, Sec. 34-15s-19e. Drlg. sh. 8,389 ft.

South Roanoke—Jeff Davis Parish

Continental Oil Co. No. 2 Sturdivant, Sec. 36-10s-4w. Drlg. sh.&shlls.

St. Martinsville—St. Martin Parish

Continental Oil Co. No. 1 Standard of Kans., Sec. 13-10s-6e. Drlg. sh. 5,411 ft.

Starks—Calcasieu Parish

J R. Turnbull et al No. 6 Industrial Lbr. Co., Sec. 30-9s-12w. T.D. 1,929 ft.; abd.

Sweet Lake—Cameron Parish

Pure Oil Co. No. 1 Stanolind O. & G. Co. fee lse., Sec. 12-13s-8w. Perf. csg. 7,112-28 ft.; killed; reperf. csg. 7,137-42 ft.; recvd. 3 stands of oil; tstg.

Valentine—La Fourche Parish

Pan American Prod. Co. No. 2-A Community, Sec. 58-17s-20e. T.D. 9,629 ft.; tried to blow out; P.B. 7,983 ft.; sdtkd.; 8,020 ft.; oil sd. 9,274-9,308 ft.; 5½-in. csg. 9,321 ft.

Venice—Plaquemines Parish

Tide Water Asso. Oil Co. No. 3 Buras Lve. Bd., Sec. 23-21s-30e. Driving pilng.

Tide Water Asso. Oil Co. No. 9 Manhattan Land & Fruit Co., Sec. 26-21s-30e. 10¾-in. csg. 2,457 ft.; top salt 5,505 ft.; T.D. 5,565 ft.; sdtrkd. 4,647 ft.; top salt 5,603 ft.; P.B. 3,725 ft.; sdtrkd. 3,807 ft.; T.D. 5,770 ft.; 7-in. csg. 5,770 ft.

Villa Platte—Evangeline Parish

Continental Oil Co. No. 1 Fontenot-Deshotels, Sec. 44-3s-2e. Drlg. sh.&L.

Continental Oil Co. No. 1 Fontenot Ludean, Sec. 45-3s-2e. Drlg. sh.&L. 8,070 ft.

Continental Oil Co. No. 3 Piere McDaniel, Sec. 44-3s-2e. T.D. 8,970 ft.; I.P. 202 B.P.D.; ¾-in. ck.

Continental Oil Co. No. 3 Opelousas-St. Landry Securities Co., Sec. 44-3s-2e. R.U.

Continental Oil Co. No. 2 Petre, Sec. 44-3s-2e. T.D. 9,050 ft.; I.P. 144 B.P.D.; ⅛-in. ck.

Continental Oil Co. No. 1 Tate, Sec. 45-3s-2e. R.U.

Continental Oil Co. No. 2 Vidrine, Sec. 34-3s-2e. Drlg. sh. 4,122 ft.

Vinton—Calcasieu Parish

J. M. Donald et al No. 1 Gordon, Benchenstein-Flynn, Sec. 34-10s-12w. T.D. 1,000 ft.; W.O.C.

C. A. Richardson et al No. 1 Vincent, Sec. 34-10s-12w. T.D. 2,249 ft.; 5-in. csg. 2,200 ft.; I.P. 94 B.P.D.; ¼-in. ck.

West Gueydan—Vermilion Parish

Magnolia Pet. Co. No. 1 Adam, Comier, Sec. 5-12s-2w. T.D. 7,720 ft.; abd.

West Lake Verret—St. Martin Parish

Shell Pet. Corp. No. 2 Jeanerette, Sec. 14-14s-12e. T.D. 8,057 ft.; sd. S.O.; top sd. 8,046 ft.; 7-in. csg. 8,040 ft.; D.S.T. rec. 12 stands of 37-grav. oil.

Woodlawn—Jeff Davis Parish

Union Sulphur Co. No. 4 Calcasieu Natl. Bnk., Sec. 12-9s-6w. Drlg. sd. 3,710 ft.

Union Sulphur Co. No. 2 Osmon, Sec. 7 9s-5w. Drlg. sd. 8,193 ft.

Union Sulphur Co. No. 1 A. H. Thomas, Sec. 12-9s-6w. T.D. 9,552 ft.; abd.

S. LOUISIANA WILDCATS

Acadia Parish

T. T. Tolson et al No. 1 J. Turner, Sec. 25-7s-1e. M.I.M.

Tri Parish Drillers, Inc., No. 1 Paul Stag, Sec. 4-7s-1w. Drk.

Assumption Parish

Humble O. & R. Co. No. 1 Milliken & Farewell Co., Inc., Sec. 79-14s-14e. 13⅜-in. csg. 2,978 ft.; drlg. sd.&sdy. sh. 9,800 ft.

Calcasieu Parish

David B. MacDaniel No. 2 Sch. Ld., Sec. 16-9s-7w. 15⅝-in. csg. 46 ft.; 10¾-in. csg. 1,299 ft.; T.D. 7,890 ft.; S.D.

Cameron Parish

Humble O. & R. Co. No. 1 Cameron Parish Sch. Ld., Sec. 16-12s-6w. Drlg. sh.&L. 7,180 ft.

Superior Oil Co. et al No. 1 Delmer, Sec. 32-14s-8w (core test). S.D. 7,490 ft.

Iberia Parish

Texas Co. No. 1 Petit Anse, Sec. 59-13s-6e. Drlg. sd. 5,200 ft.

Texas Co. No. 3-B State, Vermilion Bay, Twp. 16s-5e. Bldg. walk.

Texas Co. No. 2-B Vermilion Bay, Twp. 16s-5e. T.D. 9,667 ft.; cleaned hole with reversing tool to 6,381 ft.; twisted off D.S.

Iberville Parish

California Co. No. 1 Schwing Lbr. Co., Sec. 96-10s-10e. 20-in. csg. 177 ft.; 9⅝-in. csg.; drlg. sh. 9,280 ft.

Shell Pet. Corp. No. 1 Natalbany Lbr Co., Sec. 18-9s-2e. Drlg. sh. 2,630 ft.

La Fourche Parish

J. Perry Scranton No. 1 Martinez, Sec. 133-15s-17e. Drlg. wtr. sd. 1,407 ft.

Texas Co. No. 1 L.L.&E. Golden Meadows, Sec. 77-19s-21e. Drlg. sh. 9,155 ft.

Texas Co. No. 1 State-Catfish Lake, Sec. 77-19s-21e. 18⅝-in. csg. 90 ft.; T.D. 8,205 ft.; D.S. stk.; P.B. 5,783 ft.; sdtrkd.; drlg. sdy. sh. 8,532 ft.

Orleans Parish

W. T. Burton No. 1 L.&N.R.R., Sec. 18-11s-15e. R.U.

W. T. Burton No. 3 L.&N.R.R., Sec. 25-11s-14e. Loc.

W. T. Burton No. 1-B R. E. E. de Montluzin, Sec. 1-10s-13e. Drk.

W. T. Burton No. 1 State-Lake Pontchartrain, Twp. 10s-13e. T.D. 8,367 ft.; P.B. 7,775 ft.; sdtrkd. at 7,959 ft.; T.D. 8,165 ft.; 9⅝-in. csg. 8,165 ft.; T.D. 8,241 ft.; tstd. S.W.; D.S.T. 8,135-8,241 ft.; T.D. 11,149 ft.; cutting and pulling stk. D.S.

Plaquemines Parish

Texas Co. No. 1 L.L.&E. Bastian Bay, Sec. 43-20s-28e. Drlg. sd.&sh. 8,180 ft.

St. Bernard Parish

Gulf Ref. Co. No. 4-State-R.R. (Lake Borgne), Twp. 12s-15e. 9⅝-in. csg. 8,161 ft.; drlg. sh. 10,536 ft.

Wm. Helis et al No. 1 Mereaux Munez, Sec. 34-12s-12e. Drlg. sh.&shils. 9,038 ft.

Vendome Pet. Corp. No. 1 Kenilworth Plantation, Sec. 59-13s-14e. Drlg. sh. 10,068 ft.

St. Charles Parish

Texas Co. No. 1 L.L.&E. Paradis, Sec. 39-14s-20e. Drlg. sh. 8,178 ft.

St. James Parish

Shell Pet. Corp. No. 1 Shexnayder, Sec. 38-12s-15e. Cg. sh. 9,608 ft.

St. Martin Parish

Magnolia Pet. Co. No. 1 Mercelin, Sec. 8-10s-7e. R.U.

Texas Co. No. 11 St. Martin Ld. Co., Sec. 21-8s-7e. Top salt 8,904 ft.; T.D. 9,404 ft.; 7-in. csg. 8,912 ft.; P.B. 7,175 ft.; drld. out to bttm.; P.B. 8,080 ft.; perf. csg. 8,060-70 ft.; tstd. mud, gas and S.W.; sqzd. off perf.; perf. csg. 8,060-65 ft.; tested 38 stands oil and gas showing fresh wtr.; set screen and inr.; pmpg.; showing est. 25 B.O.; 7 inr.; lowered tbg. to 6,987 ft.; pmpg. and swbg. making est. 120 bbls. net oil per day with 57% S.W.; tstg.

St. Mary Parish

Phillips Pet. Co. No. 1 Whitney Natl. Bnk., Sec. 13-15s-12e. T.D. 1,911 ft.; twisted off drill collar; drlg. by; fsg. 3,010 ft.; run csg.

St. Tammany Parish

A. P. Portas No. 1 W. C. Forbes, Sec. 33-7s-15e. Drk.

Terrebonne Parish

Texas Co. No. 1 Continental Ld. & Fur Co., Sec. 29-18s-14e. 18⅝-in. csg. 101 ft.; T.D. 10,039 ft.; P.B. 9,852 ft.; sdtrkd. 9,984 ft.; T.D. 12,483 ft.; stk. D.S.; shot pipe 11,540-11,050 ft.; unable to pull; recvg. pipe with reversing tool.

Texas Co. No. 2 State-Coon Point, Twp. 23s-14e. 13⅜-in. csg. 1,900 ft.; T.D. 2,851 ft.; driving piling.

TEXAS

Week Ending February 4

GULF COAST FIELDS

Danbury—Brazoria County

Kirby Pet. Co. No. 1 Maller, S. A. Towsey Sur. 10¾-in. csg. 170 ft.

Hastings Field—Brazoria County

Humble O. & R. Co. No. 2 Lerew, C. W. Groos Sur., Sec. 38. Drlg. sh. 1,810 ft.

Stanolind O. & G. Co. No. 2-C Cecil Brown, W. H. Snyder Sur. Drk.

Old Ocean—Brazoria County

Commerce Oil Co. No. 1 S. M. Patterson, Polly & Chance Sur. 9⅝-in. csg. 7,000 ft.; run electrical cg. survey; T. D. 10,500 ft.; perf. csg. 10,250-75 ft., 10,160 ft.; tstd. S.W.; perf. csg. 9,950-90 ft.; tstd. S.W.

Harrison & Abercrombie No. 3 Armstrong Plantation, Polley & Chance Sur. Drlg. sh. 9,839 ft.

Harrison & Abercrombie No. 6 Bernard River Ld. & Dev. Co., C. Breen Sur. R.U.

Harrison & Abercrombie No. 1 Lola Buck, Polley & Chance Sur. Drlg. sh. 9,260 ft.

Cedar Point—Chambers County

Standard Oil Co. of Texas et al No. 56-94 State. R.U.

Seabreeze—Chambers County

Sun Oil Co. No. 2 Barrow, A. Ybarbo Sur. R.U.

Sun Oil Co. No. 1 Pipkin, W. M. Mays Sur. No. 104. R.U.

West Columbia

Frost & Dunman No. 1 E. C. Parker, G. Tennille Sur. Spd.

General Crude Oil Co. No. 1-B Campbell, S. M. Williams Sur. Loc.

Texas Co. No. 30 Abrams, G. Tennille Sur. T.D. 5,637 ft.; tstg.

Green's Lake—Galveston County

Sun Oil Co. No. 3 Houston Farms Dev. Co., D. Buckley Sur. Bldg. drk.

League City—Galveston County

Geo. Echols No. 2 J. H. Ross, Perry & Austin Sur. 10¾-in. csg. 2,550 ft.; drlg. sh. 8,529 ft.

Gulfboard Oil Corp. et al No. 1 Ross-Stewart, Perry & Austin Sur. 10¾-in. csg. 3,100 ft.; drlg. sh. 9,070 ft.

Midstates Oil Co. No. 2-A Maco Stewart, Perry & Austin Sur. Drlg. sh. 5,969 ft.

Phillips Pet. Co. No. 1 Brittnacher, S. F. Austin Sur. Drlg. sh. 6,525 ft.

Phillips Pet. Co. No. 1 J. C. Ott, S. F. Austin Sur. Cd. O.S. 7,070-9,110 ft.; drlg. sh. 9,304 ft.

Phillips Pet. Co. No. 1 Dr. Patton, S. F. Austin Sur. T.D. 10,535 ft.; 5½-in. csg. 10,412 ft.

Phillips Pet. Co. No. 1 Stewart, Title Guaranty, S. F. Austin Sur. Top sd. 9,072 ft.; cg. sh. 9,239 ft.

West Prod. Co. No. 1 fee, Lot 2, Blk. 5, Perry & Austin Sur. Loc.

Bammel—Harris County

H. M. Harrell No. 1 Bahr, J. Schnell & H. Simmons Sur. Loc.

Clear Lake—Harris County

Humble O. & R. Co. No. 3 Hutcheson, Wm. Dobie Sur. Loc.

Humble O. & R. Co. No. 3-C Humble-West fee, Geo. B. McKinstry Sur. T.D. 5,970 ft.; 5½-in. csg. 5,967 ft.; perf. csg. 5,933-35 ft.; flwd. oil and S.W.; killed.

Clinton—Harris County

Stanolind O. & G. Co. No. 2 Edwards, Reels & Trobough Sur. Drk.

Stanolind O. & G. Co. No. 1-B Oates, Reels & Trobough Sur. Drlg. sh. 4,430 ft.

Eureka—Harris County

Jack Frazier No. 1 W. T. Helberg, H Reinerman Sur. R.U.

Jack Frazier No. 3 Helberg, J. Reinerman Sur. Drlg. sh. 7,520 ft.

Housh & Thompson No. 1 Helberg et al, H. Reinerman Sur. Drlg. sh. 7,010 ft.

Houston Oil Co. No. 3 Helberg & Lackner, J. Reinerman Sur. Loc.

Houston Oil Co. No. 2 D. Lackner, H. Reinerman Sur. M.I.M.

Fairbanks—Harris County

L. Barrett No. 1 Jack Jeter, J. Bays Sur. R.U.

E. M. Hailey No. 1 Albert Brown, J. Clarkson Sur. T.D. 6,842 ft.; 5½-in. csg. 6,841 ft.

Housh & Thompson No. 1 Salge, S. Lewis Sur. Drlg. sh. 5,812 ft.

Kirby Pet. Co. No. 1 Daniels, S. S. Reynolds Sur. R.U.

Union Prod. Co. No. 2 Warneke, Sam Lewis Sur. Drlg. sh. 6,212 ft.

Friendswood—Harris County

Humble O. & R. Co. No. 29 Beemer, T. Choate Sur. Drlg. 1,510 ft.

Humble O. & R. Co. No. 1 J. L. Jones, Perry & Austin Sur. Drk.

Humble O. & R. Co. No. 3 Settegast, T. Choate Sur. Drk.

Humble O. & R. Co. No. 1 E. E. Watson. Drk.

Humble O. & R. Co. No. 4-B West, Luke Hemenway Sur. T.D. 6,043 ft.; tstg.

Humble O. & R. Co. No. 6-B West, L. Hemenway Sur. Drlg. sh. 2,468 ft.

Humble O. & R. Co. No. 5 Whitcomb, T. Choate Sur. T.D. 6,046 ft.; tstg.

Cheek—Jefferson County

Geo. H. Echols No. 1 Beaumont Launch Club, C. Hildebrandt Sur. R.U.

Humble O. & R. Co. No. 1 Broussard Tr., C. Hildebrandt Sur. Spd.

Humble O. & R. Co. No. 1 E. K. Failor, C. Hildebrandt Sur. T.D. 7,740 ft.; 5½-in. csg. 7,740 ft.; perf. 7,722-27 ft.; killed to recomp.; gas-oil ratio too high.

Cordele—Jackson County

H. J. Porter No. 1 Woussi, Peter White Sur. Loc.

Esperson—Liberty County

General Crude Oil Co. No. 1 Burgess et al, A. McNeil Sur. R.U.

Hardin—Liberty County

Atlantic Ref. Co. No. 1 Rives, A. B. Hardin Sur. Drlg. sh. 250 ft.

Gulf Oil Corp. No. 4 Cessna, H. B. Johnston Sur. R.U.

Texas Co. No. 2 Smith, A. A. Hardin Sur. R.U.

Orange—Orange County

C. L. Brown No. 2-B Lutcher Moore Lbr Co., J. Dyson Sur. Drlg. 5,386 ft. in sdtrkd. hole.

Continental Oil Co. No. 18 Chesson, Wm Dyson Sur. Loc.

Gulf Oil Corp. No. 2 Laflour, Wm. Dyson Sur. Loc.

Gulf Oil Corp. No. 3 Orange Natl. Bnk., Wm. Dyson Sur. Drlg. sh. 5,939 ft.

Gulf Oil Corp. No. 10-A Winfree, Wm Dyson Sur. Loc.

Hankamer et al No. 1 Conley, Wm. Dyson Sur. Drlg. sh. 5,134 ft.

John Mayo No. 1 M. J. Williams, J. Dyson Sur. Drk.

Union Prod. Co. No. 2 Lutcher Moore, J. Dyson Sur. Drlg. sh. 5,590 ft.

Port Neches—Orange County

Texas Co. No. 13 Kuhn, M. E. Hall Sur. R.U.

Ace—Polk County

Peyton Bros. No. 3-B Kirby West, G. F. Thomas Sur. T.D. 7,755 ft.; rec. 450 ft. P.L.O.; D.S.T. 7,745-55 ft.; will core ahead.

Segno—Polk County

Gulf Oil Corp. No. 3-B Quinn, A. Morales Sur. Drlg. sh. 5,130 ft.

Gulf Oil Corp. No. 1 Ragan, I.&G.N. Sur. No. 15. R.U.

Gulf Oil Corp. No. 5 Ragan, I.&G.N. Sur. No. 15. Loc.

Gulf Oil Corp. No. 6 Ragan, I.&G.N. Sur. No. 15. Drlg. sh. 860 ft.

Spurger—Tyler County

Republic Prod. Co. No. 17 fee, N. Hurd Sur. Drlg. sh. 3,536 ft.

Katy—Waller County

Stanolind O. & G. Co. No. 1 Cohee, Sec 109, H.&T.C. Sur. Cg. sdy. sh. 7,367 ft.

Stanolind O. & G. Co. No. 1 McCarthy, Williamson, H.&T.C. Sur. Loc.

GULF COAST WILDCATS

Austin County

Crown Cent. Pet. Corp. et al No. 1 Huebner, Renkestolz Sur. Cg. sh. 3,886 ft.

Brazoria County

Fabriguze et al No. 1 Freeport Sulphur, Stephen F. Austin Sur. (Bryan Mound) M.I.M.

Humble O. & R. Co. No. 1 Walker, S. Marsh Sur. 13⅜-in. csg. 2,419 ft.; drlg. sh. 8,039 ft.

Texas Co. No. 6 Freeport Sulphur Co C. Ariola Sur. 10¾-in. csg. 1,270 ft.; drlg. plug.

Chambers County

Geo. Anderson No. 1 Julia Casey, W. D Smith Sur. Loc.

L. D. Roberts No. 1 C. H. Lang, T.&N O. Sur. No. 35. Drk.; (cor.).

Colorado County

Coyle & Concord No. 4-B Powell, I.&G. N. Sur. No. 45. Top sd. 6,156 ft.; T.D. 6,158 ft.; 5½-in. csg. 6,004 ft.; perf. csg. 5,925-33 ft.; sqzd. with cmt.; W O.C.; perf. csg. 5,923-26 ft.; flwd. 30 bbls. fluid, 14 hrs.; 3/32-in. ck., 95% oil; tstg.

Mills Bennett Prod. Co. No. 1 J. M. Truchard, Ed Curbit Sur. 13⅜-in. csg. 968 ft.; drlg. sh. 4,567 ft.

Fort Bend County

Geo. Echols No. 1 Smith, Moses Shipman Sur. Drlg. sh. 2,637 ft.

N. W. Hunter No. 1 Lighau, B.B.B.&C. Sur. (N flank Big Creek). T.D. 6,000 ft.; S.D.

Galveston County

Sun Oil Co. No. 2 Cade, A. Dickson Sur. Drlg. sh. 2,236 ft.

Harris County

H. H. Givens No. 2 F. K. Adone, David Middleton Sur. Drk.

Jefferson County

British American Oil Co. No. 3 Glady City, J. A. Veatch Sur. (SW flank Spindletop). Drlg. 1,639 ft.

I. E. Harwell No. 1 State, Gulf of Mexico, T.D. 5,840 ft.; D.S. stk.; pulled in two; S.D.

Humble O. & R. Co. No. 13-B McFaddin-State, Sec. 8. 10¾-in. csg. 2,758 ft.; T.D. 5,859 ft.; D.S. stk.; backed off at 3,688 ft.; P.B. 4,220 ft.; sdtrkd.; T.D. 6,014 ft.; fsg.

Matagorda County

Maja Oil Co. No. 1 Robbins, A. Sheppard Sur., R.U.

Sun Oil Co. No. 1 Cavallin, Theo. F. Koch subd., John Duncan Sur. T.D. 8,502 ft.; drlg. plug; 9⅝-in. csg.

Montgomery County

Deep South Pet. Co. No. 1-A Foster Lbr. Co., Pryor Bryan Sur. Loc.

H. A. Pennington et al No. 1 F. L. Banker, L. M. H. Washington Sur. S.D. 1,033 ft.

I. Smith et al No. 1 J. V. Scott, F. A. B. Wheeler Sur. S.D. 3,623 ft.

Orange County

Sun Oil Co. No. 1 Lutcher-Moore Lbr. Co., B. Johnson Sur. T.D. 7,867 ft.; P.B.; sdtrkd.; 7-in. csg. 9,402 ft.; T.D. 9,705 ft.; D.S. stk.; P.B. 8,384 ft.; sdtrkd.; T.D. 9,664 ft.; P.B. 8,900 ft.; drld. to 9,020 ft.; perf. csg. 8,995-9,010 ft.; tstg.; flwg. est. 100 B.F.P.D., 22 to 85% S.W. and 15 to 78% oil, varying at various times.

San Jacinto County

J. W. Frazier No. 1 Annie Smith, J. D. Martinez Sur. No. 10. M.I.M.

Tyler County

J. C. Bonham No. 1 Southwestern Lbr. Co. Loc.

Waller County

Providence Oil Corp. No. 1 Ida Lee Muske, Jas. Perry Sur. 10¾-in. csg. 808 ft.; T.D. 6,607 ft.; abd.

Washington County

Mount Selman Oil Co. No. 1 Fritz Fuelberg, John Lightfoot Sur. R.U.

Wharton County

R. A. Fields No. 1 Barker, John Huff Lge. (Boling dome deep test). T.D. 5,029 ft.; abd.

S. W. TEXAS WILDCATS

Atascosa County

R. C. Stanley No. 1 Schumann, Simon Malone Sur. No. 1069. T.D. 1,722 ft.; perf. csg. 1,650-75 ft.; perf. csg. 1,654-76 ft.; flwd. fresh wtr.; S.S.O.; S.D. prep. to reperf. csg.; abd.

Bell County

M. M. Gordon No. 1 Steele, Oliver T. Tyler Sur. S.D. 1,201 ft.

G. P. Shelton et al No. 1 Nelson, Michael Griffin Sur. S.D. 1,208 ft.

Bexar County

H. G. Krumm No. 1 Kempf, Samuel McCollough, Jr., Sur. 54. T.D. 770 ft.; prep. to pmp.

Charles Schreiner No. 1 McCloskey, L. Desague Sur. No. 134. 7-in. csg. 710 ft.; pmpg. est. 6 B.O.P.D.

David Stiles No. 1 Minna Sherrer, Jos Antonio de la Garza Sur. T.D. 1,077 ft.; 6⅝-in. csg. 920 ft.; tstg.

Joe Wagner et al No. 1 Florence Lamm, Manuel De Luna Sur. Drlg. sh. 720 ft.

Blanco County

E. L. Nixon No. 2 Crist, John McClenechen Sur. No. 94. S.D. 210 ft.

Brooks County

Humble O. & R. Co. No. 3 McGill Bros., Ygnacios Rivas La Blanca gr. T.D. 4,728 ft.; run electrical survey; flwg. into tanks; no ga.

Southern Minerals Corp. No. 1 Proctor, Fel Furrias Farm & Garden Tracts. O.W.D.D.; T.D. 7,726 ft.; abd.

Caldwell County

S. T. Dudley et al No. 1 Becker, L. L. Joseph Sur. T.D. 713 ft., chk.; 7-in. csg. 685 ft.; T.D. 1,117 ft.; Edw. L.; P.B. to test Austin chk.; S.D.

Comal County

O. W. Killam No. 1 Gruene, Henry Foster Sur. Drlg. L. 960 ft.

De Witt County

Richardson et al No. 1 W. D. McCurdy, John Hunt Sur. T.D. 150 ft.

Duval County

J. W. Cosner et al No. 1 Cantu, Geraro Briones Sur. T.D. 4,210 ft.; tstd. mud and S.W.; D.S.T. 4,202-10 ft.

C. G. Glasscock No. 1 Nicholas Garcia, Santa Cruz De Concepcion gr. R.U.

Goldrus Drlg. Co. et al No. 1 Society for the Propagation of Faith, Pedro de la Zerda Sur., Sec. 7. T.D. 4,665 ft.; abd.

Gravis and Doran No. 1 Parr, San Andres gr., 1 mi. N. of Sweden field. Cg. sh. 5,086 ft.

Frank Gravis No. 3 Schallert, Seale, Morris & Seale Sur. No. 2550. T.D. 3,168 ft.; P.B. 1,800 ft.; prep. to sdtrk.

Hamill & Smith No. 1 Perez, Cordente Hrs. R.U.

Hamill & Smith No. 1 G. S. Perez, Santa Cruz De Concepcion gr. Drlg.

Interstate Minerals, Inc., No. 1 Brooker, B.S.&F. Sur. No. 85. T.D. 2,735 ft.; fsg.

Porter and Blanchard No. 1 Yates, John Gray Sur. Loc.

Transwestern Oil Co. No. 16 Duval Co. Rnh. Co., Pilar Martinez Sur. Spd.

W. A. Wagner No. 1 D. J. Weikel, John H. Gibson Sur. No. 497. R.U. and S.D.

Frio County

Hickock & Reynolds No. 1 San Antonio

Joint Stock Ld. Bnk. T.D. 3,552 ft.; abd.

Goliad County

Steinberge Pet. Corp. No. 1 Albrecht, T. Hancock Sur. T.D. 5,313 ft.; 5½-in. csg. 5,313 ft.; perf. csg. 5,238-44 ft.; pulling tbg.; cmt. job gave way; drlg. out cmt.; perf. csg. 4,804-07 ft., 4,811-13 ft., and 4,829-32 ft.; tstd. gas and S.W.; S.I.

Gonzales County

Otton Elder No. 1 Wilkinson, Russell Ward Sur. S.D. 425 ft.
Hochheim Dev. Trust No. 1 Dubose, E. G. Coffman Sur. 10-in. csg. 37 ft.; S.D. 1,170 ft.
A. L. Mitchell and L. W. Sorrell No. 1 A. I. Culpepper. Twisted off D.S.

Guadalupe County

Frank Glenn No. 1 Appling, Harriet Cottle Sur. No. 14. T.D. 2,218 ft.; tstg. 2,130-37 ft.; 7-in. csg. 1,960 ft.; R.U. to pmp.; fsg. for bailer.
Joseph Holefield No. 1 Claud Brodnax, John King Sur. T.D. 2,231 ft.; swbd. dry; abd.
E. A. Weyel No. 1 Schraffel, R. B. White Sur. Drlg. sh. 640 ft.
R. A. Williams No. 1 Weber, Guadalupe Torres Sur. T.D. 1,483 ft. (cor.); 4½-in. csg. 1,468 ft.; S.D.

Hidalgo County

Pan American Prod. Co. No. 1 J. De la Vina Vicente Hinojosa gr. Drlg. sh. 7,833 ft.

Jim Hogg County

Humble O. & R. Co. No. 6 Kelsey Bass, San Rafel gr. T.D. 4,729 ft.; flwg.; no ga.
Humble O. & R. Co. No. 1 Mestena O. & G. Co., Fowler & Rankin subd., Pallitos Blanco gr., R. G. Sars Sur. 16-in. csg. 70 ft.; T.D. 2,007 ft.; 10¾-in. csg. 1,563 ft.
Johnson & Robinson No. 1 Palacios, Mary Montgomery Sur. Drlg. sh. 2,036 ft.

Jim Wells County

F. A. Gillespie & Sons No. 1 Shear, Blk. 24, Adam Beatty & Moulton Sur. Loc.
H. H. Howell et al No. 1 W. T. Wright, Ross M. Bridges Sur. T.D. 6,800 ft.; well tried to blowout at 6,500 ft.
H. H. Howell et al No. 2 Wright, A.&M G.R.R. Sur. Drlg. sh. 2,830 ft.
Magnolia Pet. Co. No. 1 Samuel Maun, Los Olmos y Loma Blanca gr. 7-in. csg. 6,314 ft.; drlg. sh. 6,998 ft.
W. H. Mathews No. 1 Frances Clark, Los Precenos gr. 10¾-in. csg. 617 ft. T.D. 5,158 ft.; tstd. 450 lbs. press.; 1 qt. oil on D.S.T. 5,141-58 ft.

Kendall County

H. N. Reid No. 1 Marguardt, J. Travuso Sur. No. 150½. S.D. 985 ft.

Kenedy County

Humble O. & R. Co. No. 1 Kenedy rnh., Penaseal gr. Loc.

Kinney County

Bob Rose No. 2 Gaebler, Dolores Soto de Beales gr. S.D. 300 ft.

Kleberg County

Pure Oil Co. No. 1 State, Tr. No. 155, Spd.

Lee County

Fred Pederson et al No. 1 Brown, David Hudson Sur. T.D. 6,404 ft.; acd.; R.U. pmpd. S.W.; S.S.O.

Live Oak County

Harry Hotchkin No. 1 Wade, J. Sommers Sur. No. 147. Loc.
L. W. Stieren No. 3 Lange, Thos. Adams Sur. T.D. 1,497 ft.

McMullen County

Holbrook and O'Farrell No. 1 Miles, J. Poitevent Sur. Loc.
R. F. Holland et al No. 1 Gayle, B.S.& F. Sur. T.D. 1,397 ft.; 5½-in. csg. 1,390 ft.; pmpg. est. 11 B.O.P.H.; tstg.
Merle Morton No. 1 Valadez, Antonio De La Rosa, Porc 85. Loc.
R. M. Strum and Womack No. 1 Smith and Leischner, A. Zumwalt Sur. Drlg. sh. 676 ft.

Medina County

J. I. and J. W. Cromwell No. 1 Tschirhart, I. J. Rogers Sur. No. 18. Loc.
Victor Ziegler No. 1 Paul Haby, Wm. G. Still Sur. No. 1. S.D. 875 ft.; prep. to run csg.

Milam County

Alex Krause No. 1 Graves, Jackson Hall Sur. S.D. 900 ft.
McGuver and McCormick No. 1 Jacob Jose Leal Sur. T.D. 1,056 ft.; abd.

Nueces County

H. D. & H. Oil Co. No. 1 Wright, V. L. De Herrera gr. R.U.
Heep Oil Corp. et al No. 1 G. W. Smith, Jose Vicente Lopez de Herrera gr 10¾-in. csg. 1,090 ft.; drlg. sh. 4,700 ft.
Henshaw Bros. No. 1 Countiss, V. L. De Herrera gr. R.U.
Republic Nat. Gas Co. No. 1 Robertson, Vincent Lopez de Herrera gr. 10-in. csg. 1,888 ft.; cg. sh. 4,968 ft.
Seaboard Oil Co. No. 2 Wilson, Jose Vincente Lopez de Herrera Sur., Blk. 9. 13¾-in. csg. 1,551 ft.; T.D. 5,037 ft.; 9⅝-in. csg. on bttm.; perf. csg. 4,994-97½ ft.; flwg. gas and wash wtr.; kld.; reperf. csg. 4,995-98 ft.; flwd. 50 bbls. P.L.O., 4 hrs.; ⅛-in. ck.
Union Prod. Co. No. 1 Minnie Brown (Agua Dulce area). T.D. 10,723 ft.; P. B. 6,885 ft.; perf. csg. 6.850 ft.; tstg tstd. S.W.; perf. csg. 4,585-4,695 ft.; comp. as gas well.

Real County

Blakely Smith et al No. 1 Love Ranch, H.E.&W.T.R.R. Co. Sur. S.D. 310 ft.

Refugio County

Copano Oil Co. No. 1-C O'Connor, Timothy Hoyt Sur. Drlg. sh. 4,936 ft.
Coronado Corp. No. 7 Rooke, Aldrete 6¼ Lge. T.D. 5,917 ft.; tstg.
Coronado Corp. No. 8 Rooke, Aldrete 6¼ Lge. T.D. 6,384 ft.; tstg.
Phillips Pet. Co. et al No. 1 Emilie Paveleck, Aldrete 6¼ Lge. T.D. 6.525 ft.; cmtd. csg. to test 6,312-31 ft.; flwg. 10 B.P.H.; ⅛-in. ck.

San Patricio County

Culton et al No. 1 McCampbell, Peter Mahoney Sur. R.U.
Nueces Royalty Co. No. 1 Harries, J. Smith Sur. Drlg. sh. 5,550 ft.
Plymouth Oil Co. No. 1 Wilson, John Brown Sur. Bldg. drk.

Starr County

Banks Miller Oil Co. No. 1 Garcia, Juan Salinas Porc. 71. Cg. sh. 736 ft.
Rhinehart and Bowman No. 1 Bowman, J. C. McCarty Sur. M.I.M.
Sun Oil Co. No. 4 McKinney, A. J. Smith Sur. No. 240. Rec. mud on D.S.T. 5,156-67 ft.
Sun Oil Co. No. 1-B Montalvo, Los Retachez gr. Cg. sh. 4,539 ft.
Sun Oil Co. No. 1 Olivarez, C.C.S.D.&R. G.N.G. Sur. Cg. 4,212 ft.

Victoria County

H. L. Edwards No. 1 Strobe, J. M. Cobarrubias Sur. T.D. 5,165 ft.; cmtd. open hole with cmt.; set 347 ft. of 7-in. csg.; drld. out cmt. to 2,991 ft.; prep. to perf. csg.; abd.

Webb County

Rodney DeLang No. 1 Jesus Vela Cuellar, Jr., Sur. 134. T.D. 2,757 ft.; abd.
Houser & Campbell No. 1 Slator, Blk. 94 of Mission Oil Co. subd. of Jose B. Borego gr. R.U.

Williamson County

L. B. Burnette, Jr., Tr., No. 1 D. C. Reed, E. Leichtle Sur. S.D. 1,045 ft.; abd.

Zapata County

C. H. Lewis et al No. 1 Flores, Charco De La India gr. Drlg. sh. 900 ft.; (corrected).
Magnolia Pet. Co. No. 2 Duval County Ranch Co., Duval County Sch. Ld. No. 101. Drlg. 30 ft.

EAST TEXAS

(Border Counties)

Harrison County

F. H. Barnwell No. 1 Smith, A. P. Hope Sur. P.B. 2,425 ft.; tstd. dry; S.D.; W.O.

Marion County—Rodessa

Ark.-La. Gas Co. No. 2 Belcher, A. D. S. Coy Sur. Set 9⅝-in. csg. 1,022 ft.; drlg. 2,030 ft.
Gulf Prod. Co. No. 2 Blake, J. N. Jackson Sur. Set 5½-in. csg. 5,975 ft.; comp.; 130 B.P.D.; ¼-in. ck.; T.P. 125 lbs.; C.P. 1,250 lbs.; T.D. 5,990 ft.
G. Scott Hammond No. 1 W. S. Ford, C Grayson Sur. 9⅝-in. csg. 1,262 ft.; T. D. 6,099 ft.; tstd. est. 1,000,000 cu. ft. gas and 14 bbls. dist. per day; ¼-in. ck.; T.&C.P. 680 lbs.; comp.; est 1,000,000 cu. ft. gas and 15 B.P.D. dist.; ¼-in. ck.
Texas Co. No. 3 Chatten, Wm. Meyers Sur. Set 9⅝-in. csg. 2,106 ft.; 7-in. csg. 5,967 ft.; T.D. 5,988 ft.; tstg.

Marion County—Other

Tom Bell No. 1 Moseley, D. Lane Sur. Swbd. some oil; plg. tbg. 2,200 ft.
S. L. Fulton et al No. 1 Burks, G. Coor Sur. Spdg.
Gexer Oil Co. No. 7 Vincent, Davenport Sur. T.D. 2,456 ft.; 5-in. csg. 2,414 ft.; comp.; 6 B.P.D. oil and much S.W.
Van Horn & Clements No. 1 Berk, G. Coore Sur. R.U.

Sabine County

Hugo Allen No. 1 Brooks, Isaac Low Sur. S.D. 5,885 ft.; flows ⅛ to 3 bbls. 41-grav. oil and goes dead; C.P. 500 lbs.; will attempt to comp. as gas well.

San Augustine County

Superior Oil Co. et al No. 1 Long Bell Lbr. Co., S.P.R.R. Sur. 10¾-in. csg. 440 ft.; T.D. 5,723 ft.; D.&A.

WEST TEXAS WILDCATS

Andrews County

Atlantic and Standard No. 1-B Cowden, Sec. 1, Blk. 14, T.&P. Sur. U.R. 300 ft.; drlg. 4,095 ft.
Honolulu Oil Corp. No. 1-18 J. E. Parker, Sec. 18, Blk. A-44, P.S.L. Sur. Fsg. bit 4,800 ft.
Richmond Drlg. Co. No. 1 Bryant-Link, Sec. 7, Blk. 48, P.S.L. Sur. Drlg. 4,356 ft.
Rogers & Rogers No. 1-B University, Sec. 20, Blk. 9, Univ. Sur. D.&A. 4,451 ft.
J. W. Tripplehorn No. 1 M. A. Thornberry, Sec. 2, Blk. 42-A. Tstg. 5 to 10 B.O.P.D., 4,468 ft.; rng. rods 4,472 ft.

Cochran County

T. G. Shaw No. 1 Carrie S. Dean, Lge. 94. R.U.S.T. 4,979 ft.

Coke County

Barnett Pet. Co. No. 1 J. R. Mims, Sec. 39, Blk. W, T.&P. Sur. S.D. 1,861 ft.

Concho County

Clymore Co., Inc., No. 1 Hill, J. Frederick Sur. No. 1694. Drlg. 300 ft.

Crane County

Great Western Prod. No. 1-B Univ., Sec. 5, Blk. 30, Univ. Sur. Drlg. 1,120 ft.
Gulf Oil Corp. No. 5 M. B. McKnight, Sec. 1, Blk. 21-B, P.S.L. Sur. Drk.
Magnolia Pet. Co. No. 12 W. P. Edwards, Sec. 12, Blk. 23-B, P.S.L. Sur. S.I. 3,134 ft.
Magnolia Pet. Co. No. 1-18 University, Sec. 18, Blk. 30, Univ. Sur. Drlg. 2,675 ft.
Standard O. of Texas No. 1-4 University Sec. 4, Blk. 30, Univ. Sur. Drlg. 3,435 ft.

Crockett County

Hanson & Anderson No. 1 W. T. Knoelke, Sec. 30, Blk. GG, H.E.&W.T. Sur. Spd. and S.D.
Humble No. 1 Ozona-Barnhart, Sec. 4, Blk. M-N, G.S.&F. Sur. Drlg. 2,293 ft.

Culberson County

Harry Niehaus No. 1 Caldwell, Blk. 109, Sec. 13, P.S.L. Sur. S.D.R. 3,395 ft.
Quito Oil Co. No. 1 Cameron Lbr. Co., Sec. 24, Blk. 81, P.S.L. Sur. S.D.R. 945 ft.

Dawson County

Daw-Tex. Oil No. 1 J. E. Neely, Sec. 7, Blk. 35, T.&P. Sur. Rng. 7-in. 4,367 ft.

Dickens County

Bond D. Jones No. 1 Ford et al, I.&G.N. Sur. W.O. csg. 3,508 ft.
Humble O. & R. Co. No. 1 Matador Ld. & Cattle Co., Sec. 26, Blk. 1, Shock & Arnold Sur.; 6,000-ft. test. Drlg. 5,139 ft.

Ector County

M.B.K. Drlg. Co. No. 1 J. M. Gist, Sec. 9, Blk. 42, T.&P. Sur. Comp.; 1,342 B.P.D.
R. R. Rhodes No. 1 J. L. Johnson, Sec. 43, Blk. 42, T.&P. Sur. Drlg. wtr. well.
Sinclair Prairie No. 1 Fay Holt, Sec. 1, Blk. A, P.S.L. Sur. R.U.R.

El Paso County

Tri-State Oil Co. No. 1 Kinkel. S.D. 3,571 ft.

Garza County

Gulf Oil Corp. No. 1 Swanson, Sec. 25, Blk. 2, H.&G.N. Sur. Flwd. 148 B.O. in 9 hrs.; P.B. depth of 7,400 ft.; P.B. 6,821 ft.; tstd. S.W.; P.B. 6,134 ft.; tstg.; drld. out to 6,857 ft.; fsg. bailer 6,857 ft.

Hockley County

S. W. Richardson No. 1 A. E. Coe, Lbr. 53, Lge. 40, Maverick C.S.L. Sur. R. U.R.

Howard County

T. G. Shaw No. 1 Wilkerson. Drlg. 3,752 ft.
T. G. Shaw No. 1-D Wilkerson, Sec. 19, Blk. 34, T.&P. Sur. Drlg. 831 ft.

Hudspeth County

Haymon Krupp Oil & Ld. Co. No. 1 Thaxton, SE¼ Sec. 34, Blk. 74, Twp. 6. Shutting off wtr. 5,306 ft.
Haymon Krupp No. 1 Briggs, Sec. 24, Blk. 73, Twp. 7, T.&P. Sur. W.O.C. 5,365 ft.

Irion County

Clyde Crabb No. 1 W. M. Boelke, Tom Green C.S.L. Sur. U.R. 10-in. 435 ft.
J. W. Ellis No. 1 Sol Mayer, Sec. 240; Blk. 1, T.&P. Sur.; 2,100-ft. test. M.I.M.

Lynn County

John L. Baldridge No. 1 Alma Lbr. Co., Sec. 151, H.E.&W.T. Sur. W.O.C. 4,450 ft.

Martin County

T. G. Shaw No. 1 Wilkerson, Sec. 35-A, B.&C. Sur. Pulling on stk. D.P. at 3,605 ft.

Pecos County

Ben Dansby No. 1 L. C. Lessenich, Sec. 45, Blk. 9, H.&G.N. Sur. Loc.
J. L. Green No. 1 Iowa Realty Tr., Sec. 139, Blk. 10, H.&G.N. Sur. Drlg. 330 ft.
O. E. Schade No. 1 Neville, Sec. 72, Blk. 194. G.C.&S.C. Sur.; 2,500-ft. test. Drlg. 2,060 ft.
O. E. Schade No. 1 Otis Garrett, Sec. 59½, Blk. 8, H.&G.N. Sur. Drlg. 1,460 ft.
Thomason Prod. Co. No. 1 Notions, Sec. 1, Blk. 105, W. P. Howard Sur. Drlg. 1,172 ft.
S. Thompson No. 1 Elsinore Cattle Co., Sec. 54, Blk. D, G.C.&S.F. Sur. Drlg. by whipstock 7,342 ft.
J. C. Trees No. 1 fee, Sec. 63, Blk. 8, H.&G.N. Sur. Drlg. 325 ft.

Reeves County

Artie Baker No. 1 J. W. Grider, Sec. 31, Blk. 58, P.S.L. Sur. Drlg. 402 ft.

Schleicher County

Lone Star Gas Co. No. 1 Bert Page, Sec 30, Blk. L, G.H.&S.A. Sur. Drlg. 2,175 ft.; H.F.W.
Lone Star Gasoline Co. No. 2 Bert Page, Sec. 46, Blk. L, G.H.&S.A. Sur. Drlg. 1,515 ft.; H.F.W.

Scurry County

Coffield & Guthrie No. 1 First Natl. Bk., Snyder, Sec. 29, Blk. 97, H.&T.C. Sur. Drlg. 1,353 ft.
Forest Dev. Co. No. 1 J. J. Koonsman, Sec. 217, Blk. 2, H.&T.C. Sur. Drlg. 4,675 ft.

Tom Green County

Southern Cross No. 1 Unton & Upton, Sec. 20, Blk. A, A.B.&M. Sur. C.&P.
Spinner No. 1 Reed, Mason Ferry Ranch Sur. W.O.C.; cave 4,948 ft.
Tom Green Oil Co. No. 1 Schreiber, A. Krending Sur. No. 1663. Drlg. 395 ft.

Upton County

White & Wilson No. 1 Webb, Sec. 176, Blk. 1, C.C.S.D.&R.G.N.G. Sur. S.D.R. 715 ft.

Ward County

Robt. E. Mitchell No. 1 Allen, Sec. 7, Blk. 32, H.&T.C. Sur. P.B. 2,158 ft.; S.D.

Yoakum County

Honolulu Oil No. 10-695 R. Bennett, Sec 695. Drlg. 4,120 ft.
Shell Pet. Corp. No. 1 C. A. Hudson, Sec. 834. Abd. loc.
Shell Pet. Corp. No. 1 J. M. Rutts, Sec. 743. P.B. 5,240 ft.; pmp. 124 B.O.P.D., 40% b.s.&w.
Shell Pet. No. 1 Waples-Platter, Sec. 616. Spdg.
T. & P. Oil Co. No. 1 A. M. Brownfield, Sec. 802. Loc.

TEXAS PANHANDLE

Collingsworth County

C. H. Mee and C. F. Anderson No. 1 V. K. McCaskill, Sec. 18, Blk. 16, H.&G. N. Sur. S.D. 490 ft.
White No. 1 Wischamper, D.&A. 2,377 ft.
Johnson No. 1 Taylor. S.D. 875 ft.

Deaf Smith County

Uscan No. 1 Farwell. S.D. 5,650 ft.

Donley County

Robinson No. 1 Kuteman, Sec. 88, Blk. 20, H.&G.N. Sur. Drlg. 4,192 ft.

Gray County

English No. 1 Eudy. S.D. 3,977 ft.
Products O. & G. Co. No. 1 Mason Davis, Sec. 23, Blk. 23-M, H.&G.N. Sur. Loc.
Tripplehorn No. 2 Webb, Sec. 12, Blk. A-9, H.&G.N. Sur. Drlg. 2,182 ft.

Lipscomb County

Darrouzett Oil Co. No. 1 Pugh, 1½ mi. S and 1 mi. W of Darrouzett. Drlg. 2,194 ft.
M. C. Tieman No. 1 Spandle, Sec. 626, Blk. 43, H.&T.C. Sur. S.D. 1,880 ft.

Potter County

Sinclair Prairie Oil Co. No. 1 Bush, Sec. 23, Blk. 6, B.S.&F. Sur., about 3 mi. N of Amarillo; 8,500-ft. test. S.D.R. 6,161 ft.

Roberts County

Whitlock No. 1 Cunningham. Drlg. 910 ft.

E. C. TEXAS WILDCATS

Cherokee County

C. C. Lanier No. 1 A. T. O'Neal, J. M. Procella Sur., 3 mi. E of Troup. S.D. 50 ft.

Falls County

Marshall Hayes No. 1 M. Murphy, J. M. Sanches Sur., 2 mi. NE of Lott. S.D. 1,205 ft.

Grayson County

F. H. E. Oil No. 1 Graham. Chas. Quillen Sur., 1 mi. S of Collinsville. Cg. 3,885 ft.
Jim McMurrey No. 1 Dr. T. J. Long, J. Garland Sur., 2 mi. S of Collinsville; 4,000-ft. test. S.D.O. 3,929 ft.

Henderson County

Tide Water-Seaboard-Humble No. 1 Sadie Starr McGee, R. Acosta Sur., 3½ mi. NE of Murchinson. Tstg. 8,090 ft. prep. comp. as gas-dist. well; tstg. 8,216 ft.; comp.; 436 bbls. dist. daily.

Houston County

Cook & Mayo No. 1 C. A. Walling, B. Parker Sur., 4 mi. N of Grapeland. Drlg. 5,130 ft.
Leggett & Gossett No. 1 B. F. Gardner, J. Thorn Sur., just N of Weldon. R.U.

Kaufman County

Sam Knoerr No. 1 J. B. Hunter, P. Walker Sur., 5 mi. S of Terrell. Drk.
W. G. McGee No. 1 General American Life Ins. Co., John Baker Sur., 6 mi. W of Mabank. Drk.

Lamar County

Bahl Bros. & Barr No. 2 McQuiston, R. Russell Sur., ½ mi. N of Paris. S.D. 30 ft.

Limestone County

H. Gant No. 1 Vol De Long, P. Varela Sur., 1½ mi. NW of Thelma. S.D. 2,924 ft.

McLennan County

C. E. Porter No. 1 B. D. Burchett, De la Vega Sur., just SE Waco. S.D. 695 ft.

Navarro County

Guy Sitton No. 1 J. P. Fortson, T. J. Chambers Sur., 4 mi. E of Alma. S.D. 628 ft.

Reins County

McKinley & Hastings No. 1 McTaggert, B. Milder Sur., 1 mi. W of Emory. S.D. 30 ft.

Red River County

Bentley-Sheppard & Stevens No. 1 So. Pine Lbr. Co., G. S. Parks Sur., 17 mi. N of Clarksville. S.D. 71 ft.

Rusk County

Ham & Baggs No. 1 A. Griffin, J. Randolph Sur., 4½ mi. NW of Mt. Enterprise. D.&A. 3,631 ft.

Smith County

J. H. Thomason No. 1 J. W. Bartlett, R. H. Stewart Sur., ½ mi. SE of Jamestown. S.D. 1,802 ft.; S.L.M.

Trinity County

C. D. Davis No. 1 J. D. Gibson, A. Donavan Sur., 4 mi. NE of Trinity. Gas blowout 148 ft.; S.D. 2,627 ft.

Upshur County

R. E. L. Johnson No. 1 Lizzie Parker, John B. Gay Sur. Drlg. 2,901 ft.

Van Zandt County

F. A. Richardson No. 1-A B. C. Dodd, T. W. Hutchinson Sur., 2 mi. S of Grand Saline. S.D. 1,925 ft.

NORTH TEXAS WILDCATS

Archer County

Birdwell Oil Co. No. 31-B Oil Inv. Co., Lot 2, John Richards Sur., 5 mi. NW of Archer City; 4,200-ft. test. Drlg. 3,450 ft.

W. B. Omohundro No. 1 T. B. Wilson, Sec. 5, H.&T.C. Sur. Drlg. 4,265 ft.

Phillips Pet. Co. No. 1 J. B. Miller, Sec. 20, A.T.N.C.L. Sur. T.D. 4,006 ft.; O. W.D.D.; S.O. to D.D. to 4,500 ft.; C.O. 3,800 ft.

L. Sikes No. 1 Walter Ford, T. M. Cecil Sur. A-982. T.D. 4,204 ft.; O.W.D.D. to 5,500 ft.; T.D. 4,437 ft.; B.S.S.O. 4,379-4,400 ft.; cmt. 5½-in. liner on bottom bailing mud; swabbing through tubing; 4,500 ft. oil in hole; tstg.

Westmount Oil Co. No. 7 T. J. Dempsey, Sec. 10, D.C.S.L. Sur., O.W.D.D. Perf. csg. 4,139-44 ft.; S.D.O.

Baylor County

British Am. O. P. Co. No. 1 J. E. Cope, Sec. 220, T.&N.O. Sur. Drlg. 1,010 ft.

Clay County

L. T. Burns No. 1 Browning, Sec. 94 Belcher sub.; 5,000-ft. tst. Drlg. 3,000 ft.

Cooke County

H. W. Caudle No. 1 E. E. Walker, H. Gilman Sur.; 5,500-ft. tst. Drlg. 4,030 ft.

Sinclair Prairie No. 3 J. M. Best. T Toby Sur. A-1054. 6⅝-in. csg. 4,925 ft.; W.O.C.

Foard County

Fleetwood & Kaufman No. 1 Prowers, H.&T.C. Sur., Blk. A. S.D.O. 5,005 ft.

Grayson County

O. L. McDougal No. 1 Jackson, H. Coffee Sur., Abst. 204; 4,000-ft. test. S.D.O.

J. H. McMurray No. 1 T. J. Long, Jas. Garland Sur. A-441. S.D.O. 3,929 ft.; ran Schlumberger; S.S.O. 2,595-2,601 ft.

Jack County

Pitzer & West No. 1 F. Warren, Sec. 2784, T.E.&L. Sur. Drlg. 2,525 ft.

Montague County

Benton & Holmes No. 1 J. Bowers, Sec. 55, M.E.P.&P. Sur. S.S.O. 2,887-95 ft.; 6⅝-in. 2,883 ft.; tstg. est. 500 to 600 bbls. per day.

Lobban et al No. 1 Henry Payne, Wm. Donoho Sur. A-178. Drlg. 2,160 ft.

Wichita County

F. S. Freeland No. 1 J. D. Cooper, H. Hastle A-92; 4,000-ft. test. Spd. and S.D.

Wise County

H. Jackson No. 1 F. Neeley, Blk. 29, Matagorda Co. Sch. Ld. Spd. and S.D

H. M. Muse No. 1 F. F. Kaker, Blk. 16, Matagorda Co. Sch. Lds. Pits.

Wilbarger County

Lawson & Leavell No. 16 W. T. Waggoner A, Sec. 109, H.&T.C. Sur., Blk. 14. Matl. 3,500-ft. test. R.U.C.T.

Humble O. & R. Co. No. 1 T. J. Milner, Sec. 31, H.&T.C. Sur., Blk. 9; 3,000-ft rotary test; S.S.O. 1,096-1,106 ft.; to test.

Young County

Brader & Groves No. 1 J. L. Clark, Sec. 2, E.L.&R.R. Sur. 6⅝-in. 3,850 ft.; O.S. 3,850-60 ft.; est. 200 bbls.; tstg.

H. M. Leidecker No. 1 J. M. Nall, Sec. 1997, T.E.&L. Sur. Drlg. 1,515 ft.

Long & Lupton No. 1 A. Crouch, I.&G N. Sur. A-1460. 6⅝-in. 3,865 ft.; sat. L. 3,940-44 ft.; treating with acid; test wtr.; S.D.O.

Magnus & McLester No. 1 B. B. Teague, E. S. Colthrop Sur. A-1390. 6⅝-in. 3,786 ft.; G.L. 3,780-3,825 ft.; treating with 6,000 gals. acd.; est. 200 bbls.

WEST CENTRAL TEXAS DISTRICT

Brown County

A. D. Bruce No. 1 L. J. Mauldin, Sec. 15, H.&T.C. Sur. Sp.&S.D.

Oscar Howe No. 1 De Busk, Isaac Harris Sur. No. 164. S.D. 195 ft.

E. C. Norman No. 1 Stella Rice, Chas. Messenger Sur. No. 127. Rng. csg. 970 ft.

Callahan County

Dobbs Oil Co. No. 1 Finley, Sec. 75. Bayland Orphans Home Ld. Drlg. by tools 1,785 ft.

J. C. Jackson and Doug. Tomlingson, Jr., No. 1 T. J. Thompson, Sec. 30, B.B.B. &C. Sur. U.R. 1,850 ft.

Roeser & Pendleton No. 1 Chas. Yost, Sec. 18, Blk. 8, S.P. Sur. Drlg. 3,975 ft.

Coleman County

Arcadia Ref. Co. No. 1 W. R. Roberts D. J. Holt Sur. C.O. 3,104 ft.

E. E. Kirkpatrick No. 1 F. Nixon, Burnett, C.S.L. Sur. Fsg. 2,681 ft.

Comanche County

Comanche O. & G. Co. No. 1 J. E. McGuire, C. Rockefeller Sur. No. 3. Drlg. 2,850 ft.

E. T. DeArman No. 1 Moorman, Sec. 37, D.&D.A. Sur. Drlg. 1,840 ft.

O. L. Johnson No. 1 Mrs. W. Jones, Sec. 34, H.&T.C. Sur., Abst. 1610. S.D.O. 2,835 ft.

Loraine No. 1 Carlisle, Sec. 9, Blk. 2, H.&T.C. Sur. D.&A. 2,752 ft.

Plains Prod. Co. No. 1 Runkle, Sec. 47, D.&D.A. Sur. S.D. 418 ft.

Eastland County

Dobbs Oil Co. No. 1 Greer, J. E. Hardy Sur., Ellenburger test. Drlg. 1,800 ft.

Vin Gamblen No. 1 G. C. Daniels, Sec. 2, B.B.B.&C. Sur. Drlg. 400 ft.

Kleiner & Warren No. 1 Harbin, Sec. 1, Blk. 6, E.T.R.R. Sur. Drlg. 110 ft.

Erath County

Wayne Chandler No. 1 Chandler, J. W. Moore Sur., Abst. 571. S.D. 3,985 ft.

Collard No. 1 W. L. Payton, H. Pierson Sur. No. 1, Abst. 1105. S.D. 185 ft.

Fisher County

J. D. Baker No. 1 O. R. Burnham, Sec. 4, Blk. R, W. D. Richardson Sur. Drlg. 3,031 ft.

General Crude No. 1 M. M. Flores, Sec 212, Blk. 1, B.B.B.&C. Sur. Drlg. 3,536 ft.

Hamilton County

Wallace & Vickers No. 1 C. C. Lund, J. P. Bailey Sur. 51. Fsg. baller 2,200 ft.

Haskell County

Sawyer Drlg. Co. No. 1 A. J. Rowland Est., Sec. 5, Blk. 3, H.&T.C. Sur., 15 mi. E of Stamford. Fsg. swb. 5,120 ft.

Hood County

Prince & Miller No. 1 J. H. Andrews, NW cor. of Geo. Sutherland Sur. S.D. 524 ft.

Jones County

Brown Eagle No. 1 Waterson, Andrews Sur. No. 191. T.D. 2,283 ft.; S.D.

Ed. L. Evans No. 1 B. J. Crier, Sec. 8, B.A.L. Sur. Drlg. 1,310 ft.

G. M. Gillispie No. 1, Sec. 54, O.A.L. Sur. Drlg. 100 ft.

Grover, Rose & Farrell No. 1 O. D. Swanson, Sec. 193, B.B.B.&C. Sur., 2 mi. NE of Avoca. U.R. 2,880 ft.

J. H. Sproules No. 1 James Nichols, Sec. 47, Blk. 16, T.&P. Sur. C.O. prep. test 1,783 ft.

Nolan County

Chas. E. Peddicord No. 1 Tipton, Sec. 43, Blk. 19, T.&P. Sur. S.D.O. 2,827 ft

Union Oil Co. No. 1 J. D. Pepper, Sec. 51, Blk. 21, T.&P. Sur.; 5,000-ft. test 6 mi. SW Sweetwater. Fsg. 4,175 ft.

Palo Pinto County

W. K. Gordon No. 1 J. W. Conway, Ruidosa I.R.R. Sur. Bldg. rig.

Parker County

Brown-Gardner Bros. No. 1 Gilbert, T.& P. Sur., Abst. 1958. S.D. 2,200 ft.

Shackelford County

Joe DeGrazier No. 1 Harbough, E cen. part of county, Sec. 1563, T.E.&L. Sur. 4,500-ft. test. S.D. 3,894 ft.

W. J. Dettenhaim No. 1 Mrs. F. J. Lynch, Sec. 24, B.A.L. Sur. Drlg. 140 ft.

Fox & Rudd No. 1 Shotwell, Sec. 59, B.A.L. Sur. Fsg. 1,632 ft.

R. H. Gordon and Frank Pethybridge No. 1 C. B. Snyder, 330 ft. fr. N and E lines, Sec. 38, L.A.L. Sur.; 4,500-ft. test. Est. 20 to 50 B.O.P.D.; T.D. 3,660 ft.; S.D. 4,293 ft.

J. L. Hart No. 1 L. A. Sanders, Sec. 59, T.&P. Sur. Drlg. 200 ft.

W. Waddington No. 1 Cottle, Sec. 42, Univ. Sur. Sp. and S.D.

J. West et al No. 1 J. H. Kinder, Sec. 40, B.A.L. Sur. M.I.M.

Taylor County

Forest Dev. Co. No. 1 Anderson, Sec. 8, L.A.L. Sur. Drlg. 2,930 ft.

Rowan & Nichols No. 1 W. W. Martin, Sec. 29, J. M. Saucedo Sur. Rng. csg. at 2,088 ft.

Canadian Fields

(Continued from Page 106)

continued operations in the Red Coulee area of Montana, and will move its equipment into Alberta for drilling on some of the shallow structures outside Turner Valley. The company has acreage in the Taber field and also in the Steveville district, and may also drill in Saskatchewan. One outfit may be used for a test in northern Montana between the Nadeau well and the Alberta-Red Coulee field.

Keho Dome Project

Keho Dome Oils, Ltd., headed by Julius Zaetschky of Calgary, is planning to start a test this spring on the Keho dome structure in southern Alberta. Tentative location has been made in LSD 3, Section 18-11-22w4. Location is about 1¼ miles west of Hudson's Bay-Keho No. 1, drilled some years ago which got a small crude production in the Benton at 3,770 feet and shows in the top of the limestone, encountered at 4,914 feet. The Hudson's Bay well produced some 29.4 gravity crude for a few months in 1934.

Saskatchewan Operations

Drilling operations involving a total of more than 15 wells are anticipated for the province of Saskatchewan this year. For several years gas has been produced and marketed on a commercial scale from the Lloydminster field, in the west central part of the province, and this year efforts will be made to secure production in areas farther east. Oil showings, ranging from seepages to definite flows, have been encountered at various times right across the northern part of the agricultural area, from Kamsack on the eastern boundary through Simpson, in the center of the province, to the Vera and Lloydminster areas. Drilling in the latter two areas has recently secured oil showings approximating commercial production, and further development is expected this year.

Most of the drilling is being carried on by local companies, sponsored or supported in some cases by Alberta oil operators. This year interests associated with the Standard Oil Co. of California are reported planning to establish an office at Regina and carry on widespread exploratory work, starting operations in the spring.

Colony Oil & Gas Co. of Lloydminster has already drilled three wells near that town, two finishing as gassers while the third is pumping considerable crude. Three additional wells are planned for 1939, on 5,000 acres recently geologized jointly with Lloydminster Royalties. Lloydminster Royalties No. 1, LSD 4, Section 36-49-1w4, on the Alberta side close to the provincial boundary, has considerable crude at 1,925 feet and looks like a commercial producer. Triangle Gas & Oil Co., which has already drilled two wells, is planning six additional tests. Walter Thorn and associates of Moose Jaw, who have tentative arrangements to pipe natural gas to Saskatoon, will drill three wells, probably in the Vera-Unity area.

In the Maple Creek district, Western Royalties of Calgary has resumed Twin Provinces No. 1, LSD 6, Section 21-11-29w3, standing at 2,130 feet; and is changing Twin Provinces No. 2, LSD 6, Section 4-10-29w3 from cable to rotary equipment, to deepen from 330 feet. The Madison limestone is expected at 3,300 feet. No. 1 has a gas flow, estimated 1,500,000 cu. ft. a day. The Saskatchewan government has an option on production.

Alberta Drilling Rules

The Alberta Conservation Board has announced new regulations governing drilling operations in that province. Drilling and production will be regulated from selection of a drilling site through the producing period; and licenses issued by the board are subject to cancellation or suspension. Notices of plans to deepen or repair any producing well, or any well where drilling has been suspended three months or more, must be given 15 days before starting work. In drilling core samples must be taken every 10 feet. Streams and lakes must not be polluted with rotary fluid. Any hole which deviates from the vertical more than half the distance from the top of the hole to the nearest boundary must be abandoned.

Inadequate or unprotected storage facilities are prohibited. No boilers or electric generators are allowed within 150 feet of a producing well or storage tank; nor will smoking be allowed within 75 feet of any drilling or producing well or 100 feet of any storage.

Ontario Operations

In the Malahide district, Elgin County, Union Gas Co. No. 5, Lot 19, Concession 5, Malahide Township, finished below 900 feet with a fair gas production, estimated at 1,750,000 cu. ft. a day. The gas has some sulphur content, similar to that in the Brownsville field several miles to the northeast, and is believed to come from the same horizon. Additional drilling will be undertaken by the Union company.

Rocky Mountain Runs

Daily average production estimates for week ended February 4:

WYOMING

	Barrels
Salt Creek	15,150
Big Muddy	1,210
Badger Basin	160
Cody Dome	50
Cole Creek	80
Dallas Derby	350
Dewey Dome	10
Dutton Creek	40
Elk Basin	600
Frannie	2,340
Garland	1,910
Grass Creek	1,800
Hidden Dome	60
Hudson	230
Iron Creek	10
LaBarge	850
Lance Creek	12,570
Lost Soldier	1,900
Mahoney	240
Medicine Bow	2,270
Midway	30
Oregon Basin	1,300
Osage	780
Quealy Dome	730
Rock River	2,280
Spindletop	40
Poison Spider	270
Teapot	10
Wertz	1,250
Total Wyoming	48,520

MONTANA

Border	120
Cat Creek	560
Cut Bank	8,130
Dry Creek	930
Kevin-Sunburst	3,290
Lake Basin	10
Pondera	430
Total Montana	13,470

COLORADO

Florence	230
Fort Collins and Wellington	320
Wilson Creek	310
Iles Dome	2,110
Moffat	290
Orchard	20
Rangely	20
Tow Creek	130
Price	560
Total Colorado	3,990

NEW MEXICO

Cooper	4,280
Eaves	810
West Eunice	100
Eunice	22,710
Hardy	3,080
Hobbs	11,900
Jal	920
Langlie	4,740
Lynch	510
Lynn	820
Mattix	3,490
Monument	23,320
North Lynch	40
Penrose	5,690
Rhoades	140
Skaggs	110
Skelly	1,890
South Eunice	3,100
South Lovington	150
Vacuum	7,150
Artesia-Maljamar	6,520
Getty	100
Hogback	200
Rattlesnake	610
Table Mesa	70
Total New Mexico	102,450
Total Rocky Mountain region	168,430

California Field Operations For December, 1938

According to figures collected by the American Petroleum Institute, the total production of crude oil in California for December amounted to 20,034,759 bbls., an average of 646,283 bbls. per day. This is a decrease of 16,517 bbls. per day under November production.

Total stocks of crude and all products in Pacific Coast territory increased during the month 1,310,337 bbls. The total stocks at the end of the month were 158,905,036 bbls. The total stock increase for 1938 was 30,864,789 bbls. As of December 31, 1938, transfer was made of 210,000 bbls. from heavy crude to refinable crude; to incorporate this and other end-of-the-year adjustments, a second set of stock figures, labeled "reclassified," is published herewith, which will be comparable with subsequent figures.

CRUDE PETROLEUM PRODUCTION

(Figures of production and stocks are in barrels of 42 gallons)

	Total production	Daily average		
	December	Dec. 1938	Nov. 1938	Dec. 1937
Group 1:				
Belridge—North	402,026	12,968	12,498	16,151
Belridge—South	36,746	1,185	1,135	1,553
Canal	120,685	3,893	3,545	461
Canfield Ranch	1,271	41	58	.....
Coalinga	296,294	9,558	8,124	15,047
Coles Levee	5,550	179	160	.....
Edison	78,137	2,521	2,596	3,782
Elk Hills	314,419	10,143	10,224	10,962
Fruitvale	228,650	7,376	7,784	8,685
Greeley	68,459	2,208	2,419	3,772
Kern River	350,893	11,319	11,280	15,323
Kettleman Middle Dome	1,217	39	38	88
Kettleman North Dome	1,855,881	59,867	61,263	82,173
Lost Hills	99,418	3,207	3,255	3,679
McKittrick	107,832	3,479	3,537	4,359
Midway-Sunset	1,759,849	56,769	55,507	74,266
Mountain View	286,370	9,238	9,298	15,525
Mount Poso	428,056	13,808	14,145	20,923
Rio Bravo	266,758	8,605	9,704	2,559
Round Mountain	396,632	12,795	12,816	17,168
Ten Section	270,291	8,719	8,797	3,662
Tupman	.....	.....	56	.....
Wasco	19,611	633	470	.....
Wheeler Ridge	9,524	307	312	310
Group 2:				
Capitan	87,161	2,812	2,880	3,017
Elwood	149,091	4,810	5,002	7,648
Rincon	118,878	3,835	4,141	3,069
San Miguelito	77,165	2,489	2,585	3,690
Santa Barbara	13,019	420	394	567
Santa Maria	484,075	15,615	19,253	13,862
Summerland	745	24	32	31
Ventura Avenue	1,051,152	33,908	33,943	35,679
Ventura-Newhall	162,359	5,237	5,544	4,959
Watsonville	930	30	30	60
Group 3:				
Brea-Olinda	174,409	5,626	5,660	6,132
Coyote—East	85,481	2,758	3,064	4,094
Coyote—West	252,686	8,151	7,972	9,252
Dominguez	757,050	24,421	27,334	29,686
El Segundo	155,261	5,009	5,624	19,951
Huntington Beach	950,421	30,659	31,102	35,403
Inglewood	400,408	12,916	13,400	16,248
Lawndale	2,274	73	69	89
Long Beach	1,610,378	51,948	53,600	58,181
Las Angeles-Salt Lake	14,939	482	515	568
Montebello	507,464	16,370	15,572	7,237
Playa Del Rey	171,682	5,538	5,656	7,808
Potrero	31,372	1,012	634	536
Richfield	254,451	8,208	8,730	10,066
Rosecrans	460,251	14,847	15,703	5,593
Santa Fe Springs	934,361	30,141	30,616	41,011
Seal Beach	242,478	7,822	8,042	9,277
Torrance	595,859	19,221	19,303	7,616
Whittier	27,912	900	935	917
Wilmington	2,856,478	92,144	96,444	62,469
Total December	20,034,759	646,283	662,800	704,970
Total November	19,883,988	662,800	.....	.....
Decrease (*increase)	*150,771	16,517	.....	.....

OIL FIELD DEVELOPMENT

	New rigs up	Active drilling	Producers completed	Daily initial output	Active producing	Abd. wells—Drillers	Abd. wells—Producers
Group 1:							
Belridge—North	2	7	1	3,100	59	..	..
Belridge—South	..	..	..	..	87	..	..
Canal	1	3	1	928	15	..	..
Canfield Ranch	..	..	..	..	1	..	..
Coalinga	3	6	3	6,461	816	4	3
Coles Levee	2	1	..	..	1	..	..
Edison	..	2	..	..	88	..	..
Elk Hills	..	..	..	..	170	..	..
Fruitvale	3	3	1	240	174	..	..
Greeley	2	6	..	..	11	..	..
Kern River	3	2	1	25	1,369	..	1
Kettleman Middle Dome	..	..	..	..	3	..	..
Kettleman North Dome	..	7	2	2,850	218	1	1
Lost Hills	3	..	..	..	243	..	2
McKittrick	3	3	..	..	187	..	..
Midway-Sunset	4	4	2	340	2,519	5	1
Mountain View	..	..	..	..	189	..	..
Mount Poso	2	1	2	409	265	1	..
Rio Bravo	1	3	..	..	24	..	..
Round Mountain	..	1	..	..	193	1	..
Ten Section	1	1	1	2,982	26	..	..
Tupman	..	..	..	..	..	..	..
Wasco	1	2	..	..	3	..	..
Wheeler Ridge	..	1	..	..	27	..	..
Group 2:							
Capitan	..	..	..	..	51	..	..
Elwood	..	..	..	..	80	..	1
Rincon	1	..	1	435	51	..	..
San Miguelito	..	1	1	131	19	..	..
Santa Barbara	..	..	..	..	34	..	..
Santa Maria	..	1	1	2,500	304	2	..
Summerland	..	..	..	..	18	..	..
Ventura Avenue	2	9	2	2,463	258	..	..
Ventura-Newhall	..	8	2	1,215	559	3	..
Watsonville	..	..	..	..	7	..	..
Group 3:							
Brea-Olinda	..	2	..	..	350	..	..
Coyote—East	..	..	2	765	86	..	..
Coyote—West	..	..	..	..	49	..	..
Dominguez	..	2	..	..	207	..	..
El Segundo	..	..	..	..	52	..	5
Huntington Beach	2	3	3	350	551	..	2
Inglewood	..	..	..	..	208	..	..
Lawndale	..	..	..	..	6	..	..
Long Beach	..	2	2	319	1,260	..	12
Los Angeles-Salt Lake	..	..	..	..	112	..	..
Montebello	8	9	1	416	221	..	..
Playa Del Rey	..	..	..	..	183	1	..
Potrero	1	1	..	..	13	..	..
Richfield	..	2	..	..	293	1	..
Rosecrans	3	10	2	730	112	1	..
Santa Fe Springs	..	1	..	..	590	..	3
Seal Beach	..	..	..	..	109	..	..
Torrance	13	9	13	2,849	659	1	4
Whittier	..	..	..	..	147	..	..
Wilmington	4	9	7	3,656	590	..	1
Miscellaneous drilling	10	33	..	..	..	17	..
Group 4—Gas fields:							
Buena Vista Lake	..	..	..	..	4	..	..
Buttonwillow	..	..	..	..	26	1	..
Chowchilla	..	..	..	..	..	..	..
Delano	..	..	..	..	..	..	..
Dudley Ridge	..	..	..	..	..	..	..
Goleta	..	..	..	..	..	..	..
McDonald Island	..	..	..	..	5	..	..
Rio Vista	..	..	..	..	22	..	..
Semi-Tropic	..	..	..	..	1	..	..
Tracy	..	..	..	..	5	..	..
Total December	75	155	51	33,164	13,930	39	36
Total November	72	160	65	69,534	13,785	23	14
Decrease (*increase)	*3	5	14	36,370	*145	*16	*22
Average for year 1938	96	207	83	76,738	13,621	22	21
Average for year 1937	124	264	97	51,480	12,954	26	23

REVIEW OF THE YEAR 1938

Supplementing the regular monthly report, the following yearly figures are presented:

Crude-oil production for 1938 totaled 249,749,246 bbls., an increase of 11,228,863 bbls. over 1937 production. The daily average for the year was 684,244 bbls., compared with 653,481 for the previous year, an increase of 30,763 bbls. per day. Five hundred and seventeen wells were abandoned during the year. Of these, 251 were abandoned oil producers and one was a gas well; 262 were abandoned while drilling for oil and three while drilling for gas.

Below is shown the total production for the year and the daily average, also the oil-well completions and initial daily output for the year, for each oil field in the state:

	Total 1938 production	Daily average	Wells completed	Daily initial output
Group 1:				
Belridge—North	4,870,069	13,343	21	29,966
Belridge—South	442,195	1,211	4	165
Canal	849,154	2,326	12	27,917
Canfield Ranch	35,111	96	3	5,142
Coalinga	3,897,579	10,678	12	31,856
Coles Levee	10,345	28	1	826
Edison	1,102,525	3,021	2	285
Elk Hills	3,886,718	10,649	2	65
Fruitvale	3,078,492	8,434	18	4,625
Greeley	1,163,873	3,189	7	13,117
Kern River	4,589,655	12,574	26	1,163
Kettleman Middle Dome	19,539	53	.....	.....
Kettleman North Dome	25,589,925	70,109	30	60,254
Lost Hills	1,297,497	3,555	5	424
McKittrick	1,288,745	3,531	5	588
Midway-Sunset	22,875,370	62,672	33	3,328
Mountain View	4,032,837	11,049	3	3,533
Mount Poso	6,234,882	17,082	17	3,460
Rio Bravo	1,944,578	5,328	23	79,434
Round Mountain	5,473,906	14,997	35	9,684
Ten Section	2,472,779	6,775	25	60,820
Tupman	1,668	5	1	3,752
Wasco	125,063	343	2	9,528
Wheeler Ridge	113,036	310	....	.....
Group 2:				
Capitan	1,066,655	2,922	6	2,457
Elwood	2,247,430	6,157	....	.....
Rincon	1,394,626	3,821	9	2,637
San Miguelito	1,044,032	2,860	4	3,027
Santa Barbara	160,347	439	1	30
Santa Maria	6,128,278	16,790	86	80,831
Summerland	11,705	32	....	.....
Ventura Avenue	12,925,543	35,412	22	27,557
Ventura-Newhall	1,902,618	5,213	14	5,310
Watsonville	14,125	39	....	.....
Group 3:				
Brea-Olinda	2,124,838	5,822	1	32
Coyote-East	1,264,089	3,463	4	1,285
Coyote-West	3,089,884	8,465	5	1,076
Dominguez	9,756,119	26,729	16	4,284
El Segundo	3,872,044	10,608	20	11,364
Huntington Beach	11,916,950	32,649	9	843
Inglewood	5,337,308	14,623	1	276
Lawndale	28,790	79	....	.....
Long Beach	20,598,714	56,435	32	7,949
Los Angeles-Salt Lake	196,304	538	....	.....
Montebello	4,146,724	11,361	32	32,667
Playa Del Rey	2,305,321	6,316	....	.....
Potrero	219,765	302	2	1,110
Richfield	3,333,325	9,132	18	3,241
Rosecrans	3,731,776	10,224	31	32,873
Santa Fe Springs	12,630,018	34,603	2	141
Seal Beach	3,198,226	8,762	1	194
Torrance	5,203,088	14,255	129	39,648
Whittier	337,203	924	....	.....
Wilmington	34,167,860	93,611	261	312,096
Group 4: Gas Fields				
Buena Vista Lake	.....	.....	.....	.....
Buttonwillow	.....	.....	.....	.....
Chowchilla	.....	.....	.....	.....
Delano	.....	.....	.....	.....
Dudley Ridge	.....	.....	.....	.....
Goleta	.....	.....	.....	.....
McDonald Island	.....	.....	1	Gas
Rio Vista	.....	.....	6	Gas
Semi-Tropic	.....	.....	.....	.....
Tracy	.....	.....	.....	.....
Total	249,749,246	684,244	1,000	920,851

STOCKS HELD IN PACIFIC COAST TERRITORY BY CALIFORNIA OIL COMPANIES

	Dec. 31, 1938 reclassified	Dec. 31, 1938 on old basis	Nov. 30, 1938	Dec. changes
1. Gasoline-bearing crude	37,018,443	37,046,014	35,965,731	+1,080,283
2. Nongasoline-bearing crude	16,282,177	16,493,979	16,747,432	−253,453
3. Unblended nat. gasoline	2,699,455	2,699,321	2,974,191	−274,870
4. Gasoline (not including distributing and service stations)	13,259,369	13,260,958	12,985,975	+274,983
5. Naphtha distillates	*1,566,349	*1,566,349	*1,435,281	+131,068
6. Gas oil and Diesel oil	10,539,937	10,548,251	10,685,631	−137,380
7. Fuel oil residuum	70,957,881	71,136,355	70,851,285	+285,070
8. All other stocks	6,153,809	6,153,809	5,949,173	+204,636
Total	158,477,420	158,905,036	157,594,699	+1,310,337
*Estimated amount of unfinished gasoline contained in Item 5	1,350,379	1,350,379	1,199,560	.....

Market Record of Active Oil Stocks

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1938-39 High	1938-39 Low	Week ending Feb. 4 High	Week ending Feb. 4 Low	Week ending Feb. 4 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1938	Com. sh. earn. 1937	Com. sh. earn. 1936	1937 High	1937 Low	1936 High	1936 Low
69½	61	64	62½	64	Amerada Corp.	788,675	N.P.	50cQ	10-31-38	$2.00	$3.04	$2.52	114⅞	51½	125½	75
23½	21⅝	22⅝	21¾	22½	Atlantic Refining	2,663,999	$25	25cQ	3-15-39	1.00	3.51	2.59	37	18	35⅛	26⅝
21½	15⅜	18½	18	18	Barber Asphalt Co.	390,223	$10	75c	12-16-37	....	1.91	1.14	43⅜	10½	38½	21
19½	15½	16¾	16	16½	Barnsdall Oil Co.	2,250,344	$5	25cQ	2-1-39	1.00	0.85	1.01	35¼	10	28¼	14⅛
9¼	8	8⅝	8¼	8¼	Consolidated Oil Corp.	13,915,167	N.P.	20cQ	2-15-39	.80	1.48	1.18	17⅞	7	17¼	11⅛
31½	26½	27¾	27	27½	Continental Oil of Delaware	4,682,583	$5	25cQ	3-31-39	‖1.00	2.98	2.05	49	24	44⅞	28⅛
8⅜	6¾	7⅛	6⅞	7	Houston Oil (new)	1,098,618	$25	....	10-17-30	....	0.94	—0.03	17⅝	4¾	13⅞	6⅝
16½	13⅝	15	14⅝	14¾	Mid-Continent Petroleum	1,857,912	$10	35c	12-1-38	.60	2.86	2.57	35⅜	14	30⅞	17¼
17¾	10⅝	13¼	13¼	13¼	Mission Corporation	1,382,945	$10	$1	6-29-38	1.00	1.31	0.48	34	15	29⅞	16⅝
15½	11⅝	13	12¼	12⅞	National Supply	1,155,170	$10	$2 pf.‡	12-22-37	....	4.90	2.02	41⅜	17⅝	75½	19⅞
10¼	8⅝	9⅜	9	9	Ohio Oil Co.	6,563,377	N.P.	20c	12-15-38	.20	1.30	0.70	22⅞	8	18	12⅛
15⅞	10¼	11	11	11	Pacific Western Oil	1,000,000	N.P.	50c	12-20-38	.50	1.39	1.58	29¾	11¾	23½	11⅜
9¼	6¼	6½	6½	6½	Pan American Pet. & Trans.	4,702,945	$5	$1*	12-21-37	....	1.18	0.52	17⅛	7	20⅝	12¼
43¾	37⅛	40½	38¾	39½	Phillips Petroleum	4,449,052	N.P.	50cQ	3-1-39	‖2.00	5.42	4.02	64	30⅛	52⅜	33⅛
22½	20¼	21	20¼	21	Plymouth Oil Co.	1,029,800	$5	35cQ	12-12-38	1.40	2.85	1.65	29⅞	13	27⅜	11⅞
11¼	8¾	9⅝	9	9⅜	Pure Oil Co.	3,285,120	N.P.	25c	12-1-37	....	2.15	1.63	24⅜	8¾	27⅞	16
10¼	8⅝	9⅜	9⅛	9⅜	Richfield Oil Corp.	3,896,638	N.P.	50c	12-21-38	.50	0.35	...	6½	4⅛	..	..
22⅜	19	20¾	20	20½	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	12-15-38	1.00	1.97	2.00	54½	16	44	30½
15⅛	11¾	13¾	13	13¼	Shell Union Oil	13,070,625	N.P.	35c	12-20-38	.70	1.44	1.57	34¾	14⅞	28¼	14⅝
29½	21	25	23½	23⅝	Skelly Oil	1,003,949	$15	50c	12-15-38	1.00	6.07	4.42	60⅝	26½	47⅜	19½
13¾	12	12⅞	12⅜	12⅝	Socony-Vacuum	31,151,071	$15	25c	9-15-38	.50	1.82	1.38	23¼	13	17½	12½
28	26¾	28½	27⅝	28⅜	Standard Oil of California	13,014,754	N.P.	30cQ†	3-15-39	1.40	3.17	1.79	50	27⅛	47⅝	35
29⅛	26⅛	27¼	26⅝	26⅞	Standard Oil (Indiana)	15,267,030	$25	25cQ	3-15-39	1.00	3.66	3.09	50	26½	48½	32¾
50⅜	32½	50⅜	50⅜	50⅜	Standard Oil of Kansas	112,837	$10	$2	12-8-38	2.00	6.93	1.91	43	30⅝	31	25
53¼	47¼	50⅜	48⅞	50⅛	Standard Oil of New Jersey	26,224,767	$25	50c§	12-15-38	§1.50	5.64	3.73	76	42	70⅜	51⅛
66	45	58½	57½	58	Sun Oil	2,316,484	N.P.	25cQ	3-15-39	1.00	3.86	3.25	77½	44½	91	70
4¼	1¾	2⅞	2¾	2⅞	Superior Oil Corp.	1,388,079	$1	....	.....	....	0.32	0.14	7¾	1½	6¾	3
48¼	42¼	45	43½	44⅜	Texas Corp.	10,875,006	$25	50cQ	1-5-39	2.00	5.02	4.10	65⅛	34¾	55¼	28⅞
5⅞	2⅝	5⅛	4⅞	5⅛	Texas Gulf Producing Co.	888,141	N.P.	15c	12-15-38	.15	0.68	0.93	9⅝	2	8⅞	4⅝
12½	7	9⅛	8¾	9⅛	Texas Pacific Coal & Oil	888,236	$10	10c	3-1-39	.40	1.11	0.72	16⅝	5⅝	15¼	7½
14⅛	12¼	13¼	12⅝	12¾	Tide Water Associated	6,369,175	$10	25cQ	3-1-39	1.00	2.08	1.03	21⅝	13⅛	21⅜	14¾
19¾	18¼	18⅞	18½	18⅝	Union Oil of California	4,666,270	$25	30cQ	2-10-39	1.20	2.58	1.40	28¼	17½	28½	20⅝
23⅝	21	22	21½	22	Union Tank Car Co.	1,200,000	N.P.	30cQ	12-1-38	1.30	1.70	1.76	31½	22	31⅝	22⅝
3⅝	1⅝	..	..	..	Wilcox Oil & Gas	506,522	$5	....	5-10-28	....	0.24	—0.06	6¼	1⅜	5¼	2⅜

*Payable in 3½ per cent notes. †Includes extras. ‡One-tenth share $2 preferred stock. §Also 1⅛ per cent stock dividend. ‖Also right to subscribe to bonds.

New York Curb Exchange

1938-39 High	1938-39 Low	Week ending Feb. 4 High	Week ending Feb. 4 Low	Week ending Feb. 4 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1938	Com. sh. earn. 1937	Com. sh. earn. 1936	1937 High	1937 Low	1936 High	1936 Low
11¾	5	8	8	8	American Republics Corp.	1,308,049	$10	10c	7-11-38	$0.10	$0.27	$0.28	10	6⅝	..	..
7¼	5⅜	6¼	5¾	5⅞	Bridgeport Machine Co.	260,000	N.P.	$1.25	12-30-37	....	1.90	1.26	21⅜	7	21	13¼
30⅜	27¼	29¼	29¼	29¼	Buckeye Pipe Line Co.	200,000	$50	50c	3-15-39	2.00	4.02	4.40	51½	36	50	39⅝
130	97	..	..	..	Chesebrough Mfg. Co.	120,000	$25	$2Q†	12-19-38	6.50	6.73	7.46	12	95½	124¾	105
9	6⅝	9	7½	9	Cities Service (new)	3,714,317	$10	....	6-1-32	....	1.02	0.13	5⅝	1½	7⅜	3
2⅜	⅞	1	1	1	Cosden Petroleum	462,551	$1	....	.....	....	0.19	...	5½	1½	4½	1½
23¾	21½	21¾	21½	21¾	Creole Petroleum	6,975,383	$5	50cSA†	12-15-38	1.00	1.61	1.23	38¾	20¼	39	19⅞
7⅛	6¼	6½	6½	6½	Darby Petroleum	351,390	$5	25cSA	1-15-39	.50	1.36	1.26	18⅝	6½	18⅛	9
2	1¾	1⅞	1⅞	1⅞	Derby Oil & Refining	263,162	N.P.	....	.....	....	1.34	0.66	8¾	2¼	6⅜	1⅞
31	17⅛	..	..	..	Eureka Pipe Line	50,000	$50	50c	2-1-39	3.00	—0.12	—0.62	47½	24½	47½	38½
40	36	39¼	36	39¼	Gulf Oil Corp.	9,076,202	$25	25cQ	12-15-38	1.00	3.51	2.90	63½	33	59	36
69⅜	65	67	65¾	65¾	Humble Oil & Refining	8,987,840	N.P.	62½c	12-27-38	3.00	5.22	3.80	87	54⅞	80	57
19½	14⅛	16⅜	16⅛	16⅜	Imperial Oil of Canada	26,965,078	N.P.	62½cSA†‡	12-1-38	1.25	0.98	0.95	24¼	14½	24½	19¾
9⅜	6	6⅝	6⅝	6⅝	Indiana Pipe Line	300,000	$10	20c	11-15-38	.50	1.03	1.00	15	5⅞	9¾	5½
27½	24¾	26¼	25⅜	26¼	International Petroleum	14,324,088	N.P.	$1.25†‡	12-1-38	2.50	...	1.81	39½	23½	39⅝	32⅝
5	2⅛	2¾	2¾	2¾	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	.10	0.17	0.20	8¾	2⅜	5¾	2⅝
20¼	17½	18½	18	18¼	Lion Oil Refining	434,820	N.P.	25cQ	12-15-38	1.00	2.17	1.43	34	12½	17¾	7⅜
9½	8⅝	9	9	9	Lone Star Gas	5,553,747	N.P.	20c	12-22-38	.60	1.14	1.02	14¼	5¼	14¼	9⅜
7¾	6¾	7⅛	6⅞	7	Louisiana Land & Exp.	2,977,449	N.P.	5c spl.	12-23-38	.45	0.58	0.64	15¼	6⅝	15⅝	9⅞
8¾	8⅛	8¼	8⅛	8¼	Midwest Oil Co.	998,444	$10	50c	12-15-38	1.00	1.14	0.95	14⅝	6¼	..	..
5¾	4½	5⅛	5	5⅛	Mountain Producers	1,593,584	$10	30cSA	12-15-38	.60	0.76	0.62	7⅞	4⅛	8⅜	5
13⅛	12	13⅛	12½	13	National Fuel Gas	3,810,183	N.P.	25cQ	1-16-39	1.00	0.96	1.19	19½	12	23	17⅜
9¼	6½	..	..	..	National Transit	509,000	$12.50	40c	12-15-38	.75	1.19	0.79	12½	7¼	15⅜	9¼
2⅝	1½	1½	1½	1½	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	0.02	0.02	5	1⅛	6⅝	1⅝
4½	3½	..	..	..	New York Transit	100,000	$5	15c	10-15-38	.25	0.49	0.34	5⅜	3⅞	6¼	4¼
6	4	..	..	..	Northern Pipe Line	120,000	$10	15c	12-1-38	.35	0.78	0.66	12⅜	5¾	9¾	4⅞
7⅝	5½	6⅝	6⅛	6⅝	Pantepec Oil	2,441,142	$1	....	.....	....	...	0.05	9⅝	2¾	10⅛	3¼
4½	1⅝	..	..	..	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	—0.17	0.45	12¾	2	19¼	4½
3	2¼	2¼	2⅛	2⅛	Ryan Consolidated	296,931	N.P.	....	.....	....	0.46	...	6½	2¼	4¾	1⅞
5⅜	3¼	..	..	..	Southern Pipe Line	100,000	$10	15cSA	9-1-38	.30	0.85	0.41	7¼	3⅞	7⅞	3¼
39	28¾	33¾	33¾	33¾	South Penn Oil	1,000,000	$25	37½cQ	12-24-38	1.75	4.64	3.59	56	35	44	32½
22¼	17	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	50cQ	12-28-38	2.00	0.95	0.97	42	20	60	44
18⅜	17½	18⅛	18	18⅛	Standard Oil of Kentucky	2,604,790	$10	50cQ†	12-15-38	1.25	1.60	1.46	21⅛	14¾	23⅜	17⅛
8¾	5½	6½	6½	6½	Standard Oil of Nebraska	166,403	$25	25c	3-29-37	....	—0.58	0.42	13¾	8	14⅝	11
22¾	16¼	19¼	19¼	19¼	Standard Oil of Ohio	753,740	$25	25c	12-15-38	1.00	3.67	4.77	45	16	40	21¾
2⅜	2	2½	2⅛	2½	Sunray Oil	2,006,176	$1	10c	12-24-37	.05	0.42	0.26	4⅞	2	5	2⅝
5¼	3½	3½	3½	3½	Texon Oil & Land	936,024	$2	15cQ	9-30-38	.60	0.51	0.36	7⅝	2	9¾	5⅜
7⅝	4¼	4½	4½	4½	Transwestern Oil Co.	750,000	$10	....	.....	....	0.48	0.06	13⅞	4⅝	..	.
3⅜	2¾	3	2⅞	3	United Gas Corp.	7,818,959	$1	....	.....	....	0.25	0.20	13⅞	3	10¾	4

†Includes extras. ‡Payable in Canadian funds. §Of which $1 was in preferred stock.

Personal Paragraphs

W. T. DOHERTY, former division superintendent of the Humble Oil & Refining Co. in Midland, Tex., and ROBERT WELCH, Gulf Coast oil operator, have formed a partnership for operations in the West Texas Permian Basin area. Mr. Doherty last fall resigned from the Humble after 16 years' service.

MARSHALL R. SANGUINET has resigned as scout for the Republic Production Co. at San Angelo, Tex., and will move with his family to Mathis, Tex., where he will be associated with his father-in-law, H. D. MILLER, in development of the Miller ranch. Plans include the early starting of a deep test on the property.

HENRY E. LINAM, president of the Standard Oil Co. of Venezuela, sailed from New York February 3, returning to Caracas. He was accompanied by Mrs. Linam.

E. E. JACKSON has joined the Grogan Oil Co., Shreveport, La., as assistant sales manager, having resigned from a similar position with the Atlas Pipe Line Corp. of Shreveport.

H. M. HORTON, chief geologist of the Superior Oil Co. in Houston, Tex., and member of the board of directors, has resigned to enter business for himself, specializing in geological, geophysical and general land work.

ROBERT B. CURRAN, chief scout of the Carter Oil Co., Tulsa, has been shifted temporarily to the marketing department to assist in coordination of crude oil sales and purchases, occasioned by the expansion of the Carter operations. While he is on this assignment CHARLES D. WELLS, Wichita, Kans., will act as chief scout.

G. E. EVERETT, for the last three years head of the public relations department of the Western Petroleum Refiners Association, is to leave Tulsa for New York on February 10 to join the public relations staff of the American Petroleum Institute. Mr. Everett joined the refiners' organization in 1936, after serving as secretary of the Low Cost Roads Association in Kansas City, Mo., a body affiliated with the W.P.R.A. to encourage wider use of asphalt and road oil in highway construction.

J. J. PERKINS, Wichita Falls, Tex., oil man, was awarded a cup by the Wichita Falls Advertising Club for meritorious civic service and philanthropy during 1938. It was presented at the annual Wichita Falls Chamber of Commerce banquet held last week.

STANLEY A. THOMPSON, Fort Worth, Tex., independent operator, with Mrs. Thompson, will leave this week for New York, from where they sail February 11 on a 40-day tour of South America. The trip will take them through the Canal Zone, down the west side of South America, around the Cape Horn Straits, and up the east side of the continent, arriving according to present plans about March 26 in Fort Worth.

G. WILLARD RICH, of New York, was inspecting his oil properties last week in Stephens County, West Central Texas, where he brought in a new pool last summer.

E. B. SHAWVER, Wichita, has been reelected president of the Kansas Independent Oil and Gas Association, of which he was an organizer. Mr. Shawver has production in Sumner, McPherson, Sedgwick, Cowley and Butler counties.

CHESTER B. WEISS, New York capitalist and Far East refinery owner, has located in Fort Worth, Tex., to open a wildcat drilling campaign in West Central Texas. Mr. Weiss was associated with the United States Steel Corp.'s plant in Shanghai, China, for several years, after which he entered the oil business with the erection of three refineries in China.

W. A. GOFORTH, Tulsa, is president of the newly organized Stripper Well Association of Oklahoma. CHARLES E. CLOWE, Ardmore, is executive manager. New markets and new outlets for production will be sought. "It costs 10 times as much to produce a barrel of oil from a stripper well as it does from a flowing well," declared ROY M. JOHNSON, independent operator active in the organization. "The additional cost goes to labor, and the payrolls are spent in the communities where the oil is produced."

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Patrick J. White, banker and oil producer of Tulsa was married to Miss Mildred Frances Lang of New Orleans, La., in the latter city. The archbishop of New Orleans performed the ceremony on February 10.

20 YEARS AGO

John E. Reynolds, of Meadeville, Pa., is in possession of an old day book of a trading post at Fort Franklin, Pennsylvania, which shows that in 1797 three kegs of Seneca oil were listed at the equivalent of about $150 per keg. Seneca oil was crude oil. It was used medicinally.

Jesse A. Dubbs, 63, internationally known refining expert, dies in Santa Monica, Calif.

J. O. Lewis, superintendent of the U. S. Bureau of Mines experiment station at Bartlesville, Okla., has been made chief petroleum technologist of the Bureau of Mines, succeeding Chester Narramore who resigned to join the Union Petroleum Co., with headquarters in Philadelphia, Pa.

10 YEARS AGO

Oklahoma producers meet and agree to attempt to bring production of the state down to 650,000 bbls. per day effective February 14. Production is now 727,000 bbls. per day.

T. B. Slick's 40-acre Hembree lease in the St. Louis pool in Pottawatomie County, Oklahoma, produced 78,169 bbls. per acre in five months.

John McKeon resigns as vice president of the Richfield Oil Co., in charge of production, and plans to resume his activities as an independent operator.

Samuel Wylie Miller, consulting engineer for Union Carbide & Carbon Co. Research Laboratories, Inc., dies in Hollis, Long Island, New York.

FRANK CROSS, secretary-treasurer of the Sun Oil Co., Philadelphia, Pa., recently was awarded the company's 40-year service emblem, a five-sapphire gold pin.

R. R. BURRIS has been made purchasing agent for the Sun Oil Co. in the Tulsa division, succeeding T. C. HALLER, transferred to Evansville, Ind., where he will serve as purchasing agent.

MORRIS CANNAN, district geologist for the Bridwell Oil Co., has been transferred from San Antonio to Alice, Tex., following removal of the San Antonio office to the latter city.

A. K. RIDDLE, Cushing, Okla., general superintendent of the Shell Pipe Line Corp. in the Mid-Continent field for the past 24 years, has resigned. Mr. Riddle went to Cushing in 1916 and as superintendent began supervising the laying of pipe lines, which have become a network throughout the Southwest. Mr. and Mrs. Riddle and their niece, Miss Norma Keil, will sail in March on a world cruise.

T. U. WELBORN has replaced FRANK MALEY as deputy supervisor of the oil and gas division of the Texas Railroad Commission in the Kilgore district. Other changes in the personnel of that district: GORDON BINGHAM succeeds D. A. BAGGETT, JOHN ALLISON succeeds A. A. ST. JOHN and JESSE BLANTON succeeds W. O. SENTERS, each as junior accountant. WALLACE BAUMGARTEN succeeds F. L. BAYLESS and ELLIS STEMBRIDGE succeeds ALTON TOOLEY, each as inspector.

H. E. WINTER, of the Union Oil Co. of California, has been appointed engineer of the southern division and will maintain offices at the Santa Fe Springs headquarters.

J. EDGAR PEW, vice president of the Sun Oil Co., Philadelphia, Pa., made a tour of inspection through the company's holdings in the Gulf Coast area last week.

F. H. GROVES has retired as superintendent of the telegraph and telephone division for the Pure Oil Co. in Oklahoma. He began work with Pure in October, 1920, as foreman of eastern lines, with headquarters in Pittsburgh, Pa. The position he has recently been holding will be abolished and operations remaining will be turned over to A. L. PAULIN, telephone foreman at Beggs, Okla.

OSCAR L. MOORE, former member of the board of directors of the Los Angeles Gas Co. and for the past several years manager of the customers department of the Southern California Gas Co., has retired. He will be succeeded by HAROLD E. DAVIDSON, who joined the latter organization in 1923 as industrial sales engineer and later became assistant general superintendent of the sales department.

G. C. LOCKWOOD has resigned as safety director for Cities Service Oil Co., Cities Service Gas Co., and Empire Pipe Line Co. in Bartlesville, Okla., to become safety engineer for the Continental Casualty Co. in Tulsa. He will help oil companies insured by the Continental in developing safety programs. Mr. Lockwood assumed his former post in 1930. Under his direction the safety department grew from a one-man enterprise to one in which 19 men devote either part or full time to safety activity.

Appreciation Cruise

R. H. Foster, new executive vice president of the Landreth Production Corp., Fort Worth, Tex., will sail from New York Saturday of this week for a six weeks' cruise around South America, accompanied by Mrs. Foster and their daughter, Miss Elizabeth Foster. The salt-water outing is on the company, which adopted that way of expressing appreciation of 15 years' service.

R. H. FOSTER

Mr. Foster, native Texan, received his A.B. in law at Texas Christian University in 1904 and his LL.B. at the University of Texas in 1906. He began law practice at Brownwood, Tex., in the latter year, and a few years later became a member of the law firm McCartney, Foster & McGee, with offices in Brownwood and Breckenridge. In 1925 he moved to Fort Worth and with his former partner Mark McGee organized the firm Samuels-Foster-Brown & McGee. He remained with the firm until January 1, 1939, when he withdrew to devote his entire time to Landreth as executive vice president. He had helped to organize the company in 1923, had served as its attorney from that time, and for several years was a director. He will continue as counsel for Mrs. B. S. Walker, widow of the former chairman of the Landreth board.

Mr. Foster is chairman of the board of the First Christian Church, Fort Worth, a trustee of Texas Christian University, and past potentate of Moslah Temple of the Shrine in Fort Worth. He likes to hunt and fish.

JOHN G. BARTRAM, geologist for the Stanolind Oil & Gas Co., gave a review of Rocky Mountain geology at the weekly meeting of the Tulsa Geological Society Monday of this week.

FRANK B. APPLEMAN, legal assistant to Thurman Hurst, Oklahoma Supreme Court justice, resigned last week to join the staff of the Independent Petroleum Association of America.

L. R. McILHEARN, manager of the Master Petroleum Co., Dallas, Tex., on entering his office last Thursday discovered that yeggmen had blasted the safe and escaped with about $300 in cash and $1,862 in checks.

HAROLD S. KELLY, formerly division engineer for the Phillips Petroleum Co. at Oklahoma City, has been transferred to the company's Bartlesville, Okla., headquarters, where he has been made general equipment engineer.

S. C. CANARY, president of the Zephyr Drilling Co., Tulsa, suffered loss estimated at $70,000 through the burning of his beautiful residence in the outskirts of that city early last Sunday. Only the stone walls remained. Members of the family escaped in hurriedly donned clothing. Among the losses were wedding gifts received by a daughter recently married.

L. R. HOLMES is president of the Twenty-five-year Club, recently organized by California employes of the Texas Co. BERNARD E. HALLORAN is vice president, W. D. STEWART treasurer, and KATHRYN F. BARRETT secretary. Mr. Holmes is vice president of the company's California unit, in charge of refining. Members of the new club must have been in Texas service 25 years.

SHIFTS: HARRY O. REA, superintendent Oneida Oil Co., from Lomita, Calif., to Torrance, Calif.; MARK H. O'CONNELL, geologist Cities Service Oil Co., from Stockton, Kans., to Hays, Kans.; WILSON H. COCHRAN, engineer General Crude Oil Co., from Houston, Tex., to Hamlin, Tex.; RILEY S. SMITH, JR., engineer Texas Co., from Mattoon, Ill., to Litchfield, Ill.; FERRELL J. ROUSSEL, producer, from Centralia, Ill., to La-Place, La.; A. A. HUNZICKER, geophysicist Texas Co., from Mattoon, Ill., to Litchfield, Ill.; A. T. WRIGHT, producer, from Bay City, Mich., to Grand Rapids, Mich.; R. MILLER, land department, Carter Oil Co., from Kansas City, Mo., to St. Joseph, Mo.; J. B. BURNETT, manager Huasteca Petroleum Co., from Coachella, Calif., to Larchmont, N. Y.; ARNOLD BRIGANTI, vice president General Geophysical Co., from Quanah, Tex., to El Campo, Tex.; W. R. KENNEDY, engineer Texas Co., from Wichita Falls, Tex., to Olney, Tex.; FINLEY DOYLE, geologist Sun Oil Co., from Madisonville, Ky., to Evansville, Ind.; F. E. BUCHAN, chemist Pure Oil Co., from Muskogee, Okla., to Winnetka, Ill.; T. H. O'NEAL, N.K.P.M. Palembang, Pendape, Sumatra, N.E.I., to Lamesa, Tex.

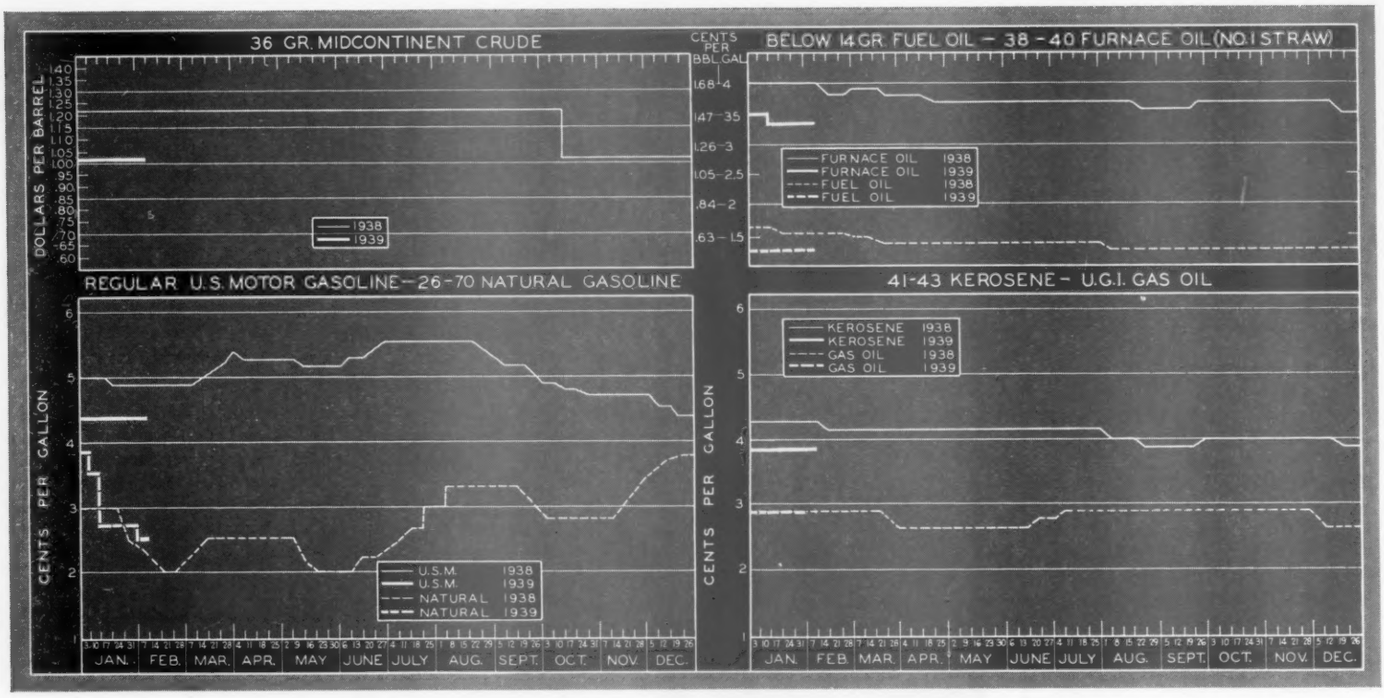
E. A. HOLBEIN, vice president of the Standard Oil Co. of New Jersey, was presented with a button commemorating 40 years of service at the annual meeting of the Jersey Standard Club last week in New York. The presentation was made by an office boy, a position in which Mr. Holbein started 40 years ago. R. W. GALLAGHER and ORVILLE HARDEN, vice presidents, and T. C. McCOBB, comptroller, were among company officials attending the club dinner, which 800 attended. C. J. BAUER, of the statistical department, received a gold pin set with one diamond, marking 20 years' service.

J. L. O'NEIL, for the past seven years superintendent of the South Penn Oil Co. in the Oil City, Pa., district, was honor guest last week at a testimonial dinner attended by 66 employes from various divisions in the district. A wrist-watch was presented to Mr. O'Neil, who on February 1 was transferred to Bradford, Pa., as superintendent of tools. Talks were given by foremen: B. H. SPENCE, Pleasantville; W. L. SHANER, Parker's Landing; A. H. SNYDER, Kansas City; G. C. ARCHER, Franklin; C. W. DEAN, Van, and FRANK STAUB, Venus. W. B. RALPH, Victory foreman, was toastmaster.

C. F. KIMBALL, formerly of the Sinclair Prairie Oil Co. offices in Midland, Tex., has been transferred to Amarillo, where he will act as district scout, replacing CHARLES P. WATSON, who has been transferred to Enid, Okla.

H. C. ARNOLD, in charge of the land and geological department of the British American Oil Producing Co., Tulsa, was elected a vice president at the annual board meeting, attended by A. L. ELLSWORTH, of Toronto, Canada, president. Mr. Arnold joined the British American as chief geologist.

GLENN BYERS, Shell Petroleum Corp., St. Louis, Mo., has been appointed chairman of the American Petroleum Institute's 1939 committee on accident prevention in refineries. Other chairmanship appointments: T. G. DELBRIDGE, Atlantic Refining Co., Philadelphia, Pa., testing methods and specifications; T. B. RENDEL, Shell Petroleum Corp., Wood River, Ill., motor fuel research; N. E. LOOMIS, Standard Oil Development Co., New York, refinery technology; L. L. DAVIS, Continental Oil Co., Ponca City, Okla., corrosion of refinery equipment; C. E. Townsend, Sun Oil Co., Philadelphia, Pa., fire prevention in refineries.


36 GR. MIDCONTINENT CRUDE
DOLLARS PER BARREL
1938
1939
CENTS PER BBL. GAL
BELOW 14 GR. FUEL OIL — 38 - 40 FURNACE OIL (NO. 1 STRAW)
FURNACE OIL 1938
FURNACE OIL 1939
FUEL OIL 1938
FUEL OIL 1939
REGULAR U.S. MOTOR GASOLINE — 26 - 70 NATURAL GASOLINE
CENTS PER GALLON
U.S.M. 1938
U.S.M. 1939
NATURAL 1938
NATURAL 1939
41-43 KEROSENE — U.G.I. GAS OIL
KEROSENE 1938
KEROSENE 1939
GAS OIL 1938
GAS OIL 1939
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Group 3 Refinery Market Lacks Life; Natural Gasoline Slipping Again

By T. F. SMILEY

Group 3 refiners surveyed a zipless market this week. Motor fuel of the higher octanes was in fairly brisk demand, but unfavorable conditions in other respects kept it from harvesting the full benefit of gallonage. The furnace oils looked a little better as a result of wintry weather over extended areas, but it remained necessary for heavy withdrawals from inventories to be made before the improvement could be expected to take the form of higher prices. Natural gasoline was headed downward again.

Notwithstanding heavy snowfalls in regions supplied by Oklahoma refiners, gasoline consumption was running at higher levels than usually are witnessed in February, suggesting the profitable business that might be on the books under well-ordered market conditions.

Gasoline Stocks Too High

The need of more rigid restrictions of runs to stills is revealed by ominous additions to inventories in recent weeks. Although the nation's stocks are some 8,000,000 lower than they were a year ago, market observers agree that they are too high and that there is danger of the industry repeating its blunder of other years and again entering the season of heavy consumption with more gasoline in tanks than can be absorbed.

A growing disposition among refiners to close their plants rather than sell gasoline at the prevailing quotations was reported. Refiners in East Texas last Thursday reduced their wholesale gasoline prices a quarter-cent, the first break in quotations in that area since crude prices were cut late in 1938. Third-grade gasoline (the old 62-octane and below) was in fair demand.

Refined Oil Market Barometer

Gasoline and fuel oils off on East Coast, but in slightly improved position in interior areas. Recession of fuel oils in East ascribed to soft tanker rates. Continued big additions to nation's gasoline stocks causing concern. Natural gasoline, following a month of weakness, went lower and needs support of export buying to check further decline. Lubricants improving.

MID-CONTINENT. Gasoline and heating oils steadier. Natural gasoline off.

EAST COAST. Fuel oils off, though consumption high. Gasoline less firm.

GULF COAST. Fuel oils stronger. Gasoline weak. General market slightly improved.

PENNSYLVANIA. Bright stock stronger. Fuel oil prices firm. Retail gasoline irregular.

CALIFORNIA. Smudge oil and furnace oil slightly firmer. Gasoline and natural dull.

CHICAGO. Gasoline moderately better. Heating oils irregular. Heavy industrial steady.

Cold temperatures, accompanied by snow and sleet, started a welcome trickle of orders for light fuels, injecting a little cheer where it was much needed. Substantial drafts on the inventories of Mid-Continent refiners were attended by a definitely improved market tone. No advances in prices were reported, but there was a stiffening of existing quotations. Since total stocks of gas oil and distillates have been falling steadily, it seems certain that a little more cold weather will remove cause for worry over this division of the oil products among Mid-Continent refiners.

Natural gasoline, which had been limping for a month, tumbled in both Oklahoma and Texas. Just enough orders had been reaching small plants to enable them to ship their output as fast as it was produced. A little shrinkage of demand in the past week created trouble for these plants, with their limited storage facilities, and some of them were forced to resort to concessions to move accumulating material. In the weakened state of the market the reduced prices became general.

Export inquiries for natural were reported to be in the market, but the effect of these had not yet been felt at the field plants. The course of prices in the immediate future hinges on the extent to which these inquiries are translated into contracts. A few fair-sized export orders would check the sliding of quotations to lower levels, sales managers said.

Lubricants Less Weak

A faintly better feeling was discernible in the lubricant group. The progressive weakness which characterized that section of the market for months seems to have ended. In neither neutrals nor bright stocks has there been recently such readiness to grant concessions as was observable a few weeks ago. The welfare of the lubricants is tied up closely with that of the manufacturing industries, and better prices are believed to be assured if mills and factories continue to expand their operations. The rising demand for lighter motor oil should help the neutrals.

The heavy fuels retained the better tone that has marked them in recent weeks. Wax was one product that disclosed unqualified strength.

Adjustment in Fuel Oil Market Is Forced by Competition

By H. STANLEY NORMAN

NEW YORK, Feb. 7.—Effective February 7, Standard Oil Co. of New Jersey and Standard of Louisiana lowered marine Diesel fuel oil prices 10 cents per barrel at all Atlantic and Gulf Coast terminals. The New York, Boston, Philadelphia, and Norfolk price is now $1.65 per barrel while $1.45 is posted at New Orleans and Baton Rouge, La.

Soft coastwise tanker rates and willingness of suppliers to reduce their margins accordingly brought an adjustment in the New York fuel oil market last week despite existence of winter record demand. Price concessions in the fuel oil market had been practiced openly in several directions and finally on January 31, Standard Oil Co. of New Jersey capitulated to competitive conditions and adjusted its New York tankcar quotations from No. 2 fuel oil to industrial grades. Coastwise tanker rates declined to a new low for the current downward movement. Several boats were chartered for trips up the coast for gasoline at 18 cents per barrel, representing a decline of 2 cents per barrel from the preceding week and a reduction of 10½ cents per barrel from the high on clean tonnage established early in December. The rates applicable to dirty boats were reduced correspondingly with 19 cents applying to several fixtures for February.

On January 31, Standard Oil Co. of New Jersey adjusted its fuel oil market quotations downward a quarter of a cent per gallon on practically all grades. No. 2 fuel oil was lowered to 4 cents as was No. 4 fuel oil, distillate fuel oil, gas oil and two grades of Diesel fuel for shore plant consumption. Industrial fuel oil in tankcars was quoted by Standard of New Jersey in its adjusted schedule at 3¾ cents.

Temperatures throughout the northeastern Atlantic district moderated in the middle of the past week after the winter's most prolonged period of subfreezing weather. Consumption of fuel oil reached new peaks for the current winter season during the last half of January, a condition which contributed to the firmness of the cargo market on the Gulf Coast where refiners resisted all downward pressure and held their quotations firm for No. 2 fuel oil at 3⅜ cents per gallon.

The kerosene market was reported under pressure in New York late last week as suppliers accepted barge delivery orders for as little as 4⅜ cents, although a bulk of the movement appeared at 4½ to 4¾ cents per gallon. Market observers, however, expected the kerosene market to undergo adjustments similar to that applied to the heavier fuel oils, particularly in light of continued weakness in the tanker market which does not appear to have reached bottom. The tank-wagon market for kerosene was reported unchanged in most areas and the demand was particularly brisk in New England. Kerosene tank-wagon prices, however, were lowered generally throughout New England and upstate New York during December and January and for this reason probably will be slower to respond to the tankcar fluctuations.

Motor fuel was also under pressure in New York, Philadelphia and Boston, although consumption has been at unexpectedly high levels considering the season. While the eastern Atlantic section has had more snow this winter than in the past two years, the falls have been intermittent and well-equipped highway departments have been successful in keeping the main arteries open to comfortable travel.

Reports persist in the New York market that high-octane motor fuel can be purchased in tankcars at 5¾ cents and an occasional transaction at 5⅝ cents is discussed in trade circles. A bulk of the spot tankcar motor fuel movement, however, appears to be in the range of 5⅞ to 6⅛ cents. Most of the material reported at 5⅝ cents is restricted to barge delivery. Weakness is also reported from the Boston and Philadelphia areas, but price concessions appear less numerous in those two terminals than at New York.

The tank-wagon fuel oil market is demoralized. Some distributors are passing on the lower boat rates and reduced tankcar quotations. The low of the tank-wagon market for No. 2 fuel oil appears to be about 5⅛ cents per gallon, although the volume of business transacted at this level is strictly limited. Most distributors are asking not less than 6 cents, which is the quotation instituted last week by one of the large eastern suppliers to the northern New Jersey trade. In most New York suburban districts suppliers are still asking 6⅛ to 6½ cents for No. 2 fuel oil in tankwagons.

Inquiries reaching Gulf Coast refiners indicated interest is growing in the spring motor fuel market, but most of the requests for quotations have been in the nature of feelers. One cargo of 65-octane motor fuel was sold on the Gulf Coast last week for February loading at 4.7 cents per gallon, just a shade under the last previous sale which was at 4⅞ cents for this material. Actual sales of both coastwise and export gasoline in the Gulf Coast spot market have been strictly limited since the turn of the year, although contract deliveries in both channels of trade have been at least meeting expectations. The lack of activity in the spot market leaves the price levels somewhat in doubt. but, in general, the domestic quotations appear to range from 4⅜ to 5⅛ cents, depending on octane specifications. In the export market, the range is from 4¼ to 5½ cents, also depending on octane specifications.

The wax market continued as one of the strong features in the entire list. Shipping instructions were received by suppliers in keeping with current production and the market of 2.4 to 2.45 for crude scale grades appears on firm foundation. The fully refined grades range upward from 3⅜ cents at both New York and New Orleans.

Bunker C fuel oil demand is holding up well and the market of 95 cents per barrel at northern Atlantic terminals appears to be firmly entrenched. Reports reached New York last week that some Gulf Coast suppliers were shading their offerings below the former level of 67½ to 70 cents, but no material was reported available below 65 cents. Tank-wagon deliveries are being made by some suppliers of industrial fuel oil in the northern sections at 3 cents per gallon and at fractional concessions down to 2.85 cents.

Strength displayed recently by bright stocks in the western Pennsylvania refining area continued last week, although some suppliers are tardy in moving their quotations forward. The range for 25 pour-test bright stock is from 14 to 16 cents per gallon, depending on the current stock position. There is a brisk demand in the western Pennsylvania district for cracking stock and the result has been a firming of fuel oil prices. Minimum of 4¾ cents was asked in Pennsyl-

(Continued on Next Page)

A. P. I. Weekly Refinery Statistics

Week Ending February 7, 1939

	Capacity reporting (per cent)	Daily crude runs (bbls.)	Total gasoline stocks	Gas oil and fuel oil stocks
East Coast	100.0	477,000	18,359,000	10,001,000
Appalachian	85.9	100,000	3,171,000	770,000
Indiana, Illinois, and Kentucky	89.5	429,000	13,383,000	6,421,000
Oklahoma, Kansas, and Missouri	81.6	241,000	7,252,000	4,293,000
Inland Texas	50.3	109,000	1,877,000	1,939,000
Texas Gulf	89.5	750,000	10,642,000	9,298,000
Louisiana Gulf	97.3	110,000	2,503,000	1,659,000
North Louisiana and Arkansas	55.0	40,000	431,000	887,000
Rocky Mountains	54.2	50,000	1,581,000	684,000
California	90.0	472,000	14,840,000	98,427,000
Total reported	85.8	2,778,000	74,039,000	134,379,000
Estimated unreported	.....	362,000	5,110,000	3,210,000
*Estimated total	.....	3,140,000	79,149,000	137,589,000
*Estimated total previous week	.....	3,235,000	77,279,000	139,349,000
*February 5, 1938	.....	3,149,000	86,788,000	120,575,000

*Bureau of Mines, currently estimated.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATES)

Week ending January 21, 1939	271,110,000 barrels
Week ending January 14, 1939	271,819,000 barrels
Week ending January 29, 1938	304,424,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

Retail Oil Markets

Tank-wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms

Prices as of February 4, 1939

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline			Kero.
	Tank-wag.	Dir.	Inc. tax	tank-wag.
Chicago, Ill.	15.1	12.1	4.0	10.0
Decatur	15.1	12.6	4.0	10.0
Joliet	15.1	12.6	4.0	10.0
Peoria	15.1	13.1	4.0	10.0
Quincy	14.9	12.9	4.0	8.7
Davenport, Ia.	15.1	13.6	4.0	†10.0
Des Moines	14.9	13.4	4.0	‡9.8
Mason City	15.3	13.8	4.0	†10.2
Duluth, Minn.	16.9	15.4	5.0	10.8
Mankato	16.5	15.0	5.0	8.9
Minneapolis	16.0	14.5	5.0	10.4
LaCrosse, Wis.	16.5	15.0	5.0	10.4
Green Bay	16.9	15.0	5.0	10.3
Milwaukee	16.3	13.4	5.0	10.2
Detroit, Mich.	13.1	11.6	4.0	7.1
Grand Rapids	14.8	13.05	4.0	9.7
Saginaw	15.8	14.3	4.0	9.3
Evansville, Ind.	16.6	15.1	5.0	†10.5
Indianapolis	16.8	15.3	5.0	†10.0
South Bend	17.1	15.6	5.0	†9.0
Fargo, N. Dak.	16.7	15.2	4.0	11.6
Minot	18.0	16.5	4.0	12.9
Huron, S. Dak.	17.0	15.5	5.0	10.9
Kans. City, Mo.*	14.4	11.9	4.0	7.5
St. Louis*	14.2	12.7	4.0	8.0
St. Joseph	14.4	11.2	4.0	9.3
Wichita, Kans.	13.9	10.6	4.0	7.3

*State tax 2 cents, 1-cent city tax and 1-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gallons or more, 1.5 cents off; minimum delivery 25 gallons.

Stanolex Fuel Oil in Chicago

Effective January 30, 1939, f.o.b. Chicago tank-wagon prices: Standard range oil, 1-99 gallons, 9.25 cents; 100-149 gallons. 8.25 cents; 150 gallons and over, 7.75 cents. Stanolex fuel oil No. 1, 1-149 gallons, 8.25 cents; 150-399 gallons, 7.25 cents; 400 gallons and over, 6.75 cents. Stanolex furnace oil, 1-149 gallons, 8.25 cents; 150-399 gallons, 7.25 cents; 400 gallons and over, 6.75 cents. Stanolex Grade A, 1-399 gallons, 5 cents; 400 gallons and over, 4 cents. Stanolex Grade B, 1-799 gallons, 4.75 cents; 800 gallons and over, 3.75 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline			Kero.
	Tank-wag. con'r.	Di-vided dir.	Inc. tax	tank-wag.
Ohio points	16.0	15.0	5.0	*13.0

*Includes state tax of 1 cent.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline			Kero.
	Cons'r. tank-wag.	Net dlr.	Inc. tax	tank-wag.
Atlanta	18.5	15.5	7.0	8.5
Augusta	19.5	16.5	7.0	10.0
Macon	18.0	15.0	7.0	11.0
Savannah	19.0	16.0	7.0	8.0
Birm'ham, Ala.	21.0	18.0	8.0	8.5
Mobile	21.0	18.0	9.0	8.5
Montgomery	21.0	19.0	9.0	10.5
Jackson, Miss.	17.5	14.5	7.0	9.5
Vicksburg	19.0	16.0	7.0	9.0
Jacksonville, Fla.	20.0	17.0	8.0	8.0
Miami	19.5	16.5	8.0	8.0
Pensacola	21.0	18.0	9.0	8.0
Tampa	19.0	16.0	8.0	8.0
Lexington, Ky.	19.0	16.0	6.0	10.0
Covington	17.5	14.5	6.0	9.5
Louisville	17.5	14.5	6.0	9.0
Paducah	18.5	15.5	6.0	9.0

Price basis to tank-wagon consumers: Effective January 4, 1937; 3 cents per gallon below tank-wagon price. Effective June 4, 1938, 2 cents per gallon discount eliminated from all kerosene markets in Mississippi, Alabama, Georgia, and Florida, markets being reduced correspondingly to a net basis.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline			Kero.
	Cons. tank-car	Dir. tank-wag.	Inc. tax	tank-wag.
Atl'tic City, N. J.	10.9	12.7	4.0	8.0
Newark	10.9	12.7	4.0	8.0
Annapolis, Md.	12.85	14.35	5.0	9.5
Baltimore	12.25	13.75	5.0	8.5
Cumberland	13.65	16.15	5.0	10.0
Wash'g'n, D. C.	10.50	12.0	3.0	9.5
Danville, Va.	14.45	16.95	6.0	12.9
Norfolk	13.25	15.75	6.0	11.5
Petersburg	13.55	16.05	6.0	11.7
Richmond	13.55	16.05	6.0	11.7
Roanoke	14.75	17.25	6.0	11.0
Charles'n, W. Va.	14.05	16.55	6.0	12.6
Parkersburg	13.35	14.85	6.0	11.2
Wheeling	14.35	15.75	6.0	12.2
Charlotte, N. C.	15.65	18.15	7.0	12.1
Hickory	16.15	18.65	7.0	12.5
Mt. Airy	15.95	18.45	7.0	12.3
Raleigh	15.25	17.75	7.0	11.6
Salisbury	15.75	18.25	7.0	12.2
Charleston, S. C.	14.25	16.75	7.0	10.6
Columbia	15.25	17.25	7.0	11.6
Spartanburg	15.95	18.45	7.0	12.4

Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at time by hose connection, on yearly purchases: From 2,500 to 100,000 gallons, consumer tank-wagon price at time and place of delivery; 100,000 gallons per year, consumer tankcar price plus .5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less .5 cent per gallon.

Discounts for kerosene, 1 cent off tank-wagon price for 25 gallons or more under contract (contract not necessary in Baltimore) except no discount in New Jersey.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline			Kero.
	Tank-wag.	Serv. sta.	Inc. tax	tank-wag.
San Francisco	17.5	18.5	4.0	11.5
Los Angeles	17.0	18.0	4.0	10.0
Fresno, Calif.	18.5	19.5	4.0	12.5
Phoenix, Ariz.	21.5	22.5	6.0	*17.5
Reno, Nev.	20.5	21.5	5.0	13.5
Portland, Ore.	20.0	21.0	6.0	13.5
Seattle, Wash.	20.0	21.0	6.0	13.5
Spokane	23.0	24.0	6.0	16.5
Tacoma	20.0	21.0	6.0	13.5

*Includes 5-cent state tax.

Discounts to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents; to split dealers, 2 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gallons and over, advance quantity discount extended at time of delivery, 3 cents. Service station schedule applies on single deliveries less than 40 gallons. On kerosene in tankcar, transport truck and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank-wagon.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline			Kero.
	Cons. tank-car	Dir. tank-wag.	Inc. tax	tank-wag.
Albany	11.75	13.8	5.0	8.0
*Met. N. Y.:				
Manhat., Bronx	11.75	12.9	5.0	8.0
Staten Island	11.75	12.9	5.0	8.0
Queens, B'klyn.	11.75	12.9	5.0	8.0
Buffalo	12.0	12.5	5.0	7.5
Rochester	12.5	13.5	5.0	7.5
Syracuse	12.4	13.5	5.0	8.5
Boston, Mass.	10.5	12.5	4.0	7.0
Portland, Me.	11.75	14.0	5.0	7.5
Manch'ter, N. H.	12.3	14.5	5.0	8.0
Burlington, Vt.	12.3	14.7	5.0	9.0
Springf'd., Mass.	11.0	13.0	4.0	7.5
Worcester	11.0	13.0	4.0	7.5
Hartford, Conn.	10.9	12.9	4.0	6.5
New Haven	10.8	11.5	4.0	6.0
Providence, R. I.	10.5	12.5	4.0	7.0

*Does not include 2 per cent city sales tax which is calculated on basis of net retail price exclusive of state and federal taxes. Metropolitan New York prices are undivided dealer prices; others are split dealer.

Price basis to undivided dealer: Posted dealer tank-wagon price less .5 cent. Price basis to commercial consumer: Effective Nov. 15, 1936, monthly purchases of 25,000 gallons and over, consumer tankcar prices at delivery point plus .5 cent per gallon; monthly purchases of 5,000 to 25,000 gallons, undivided dealer price at delivery point; monthly purchases under 5,000 gallons, pay divided dealer tank-wagon prices at delivery point.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline		Kero.
	Dealer	Inc. tax	tank-wag.
Denver, Colo.	15.5	5.0	11.5
Grand Junction	16.0	5.0	15.0
Pueblo	14.5	5.0	10.5
Casper, Wyo.	17.0	5.0	11.5
Cheyenne	15.0	5.0	13.0
Billings, Mont.	18.0	6.0	13.0
Butte	19.5	6.0	15.5
Great Falls	18.0	6.0	15.5
Helena	19.0	6.0	15.5
Salt Lake City, Utah	16.0	5.0	16.0
Boise, Idaho	19.0	6.0	18.0
Twin Falls	19.5	6.0	18.0
Albuquerque, N. M.	16.0	*6.5	10.0

*Includes city tax of .5 cent.

Pennsylvania, Delaware, and Part of New England

ATLANTIC REFINING CO.

	Gasoline			Kero.
	Cons. tank-car	Dir. tank-wag.	Inc. tax	tank-wag.
Philadelphia, Pa.	12.0	13.0	5.0	10.0
Pittsburgh	13.0	15.0	5.0	10.5
Allentown	12.75	14.25	5.0	10.5
Erie	13.0	14.5	5.0	10.0
Scranton	13.0	14.5	5.0	10.5
Altoona	13.0	15.0	5.0	10.5
Dover, Del.	...	13.5	5.0	10.5
Wilmington	...	12.5	5.0	9.75

Price basis to undivided dealers, dealer tank-wagon price less .5 cent per gallon. Price basis to commercial consumers in Pennsylvania and Delaware, effective March 11, 1937: Consumers under contract using 100,000 gallons or more per year full compartment hose deliveries, tankcar plus .5 cent. Consumers under contract using less than 100,000 gallons per year compartment hose deliveries, undivided dealer price. Consumers under contract less than full compartment delivery, consumers not under contract, less than full compartment delivery, and consumers not under contract full compartment delivery, divided dealer price. Less than 25 gallons, tank-wagon delivery, 4 cents per gallon above undivided dealer price.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline			Kero.
	Tank-wag.	Dir.	Inc. tax	tank-wag.
Omaha	17.5	16.0	6.0	10.3
McCook	17.5	15.5	6.0	10.0
Norfolk	17.9	14.9	6.0	10.7
North Platte	18.3	16.4	6.0	11.0
Scottsbluff	17.0	14.9	6.0	11.2

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline			Kero.
	Cons. tank-car	Dir. tank-wag.	Inc. tax	tank-wag.
N. Orleans, La.	16.75	19.25	*10.0	†11.0
Baton Rouge	14.75	17.25	8.0	‡10.5
Alexandria	14.75	17.25	8.0	‡12.5
Lafayette	15.00	17.50	8.0	‡12.5
Lake Charles	14.75	17.25	8.0	‡12.5
Shreveport	13.50	16.00	8.0	‡11.0
Knoxville, Tenn.	18.00	20.50	8.0	14.5
Memphis	16.00	18.50	8.0	12.5
Chattanooga	17.50	20.00	8.0	14.0
Nashville	17.00	19.50	8.0	12.0
Bristol	18.25	17.00	8.0	14.5

*Includes 2-cent parish tax. †Includes 1-cent parish tax and 1-cent state tax. ‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gallons or more in one delivery take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gallons at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less .5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gallons, consumer tankcar plus 2 cents per gallon; 50 to 199 gallons, consumer tankcar plus 1 cent per gallon; 200 gallons and over, consumer tankcar plus .5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline		Kero.
	Dealer	Inc. tax	tank-wag.
Muskogee, Okla.	13.5	5.0	7.0
Oklahoma City	11.5	5.0	6.0
Tulsa	10.0	5.0	6.0
Fort Smith, Ark.	13.25	5.0	7.5
Little Rock	16.75	7.5	9.0
Texarkana	12.0	5.0	8.0

Texas

	Gasoline			Kero.
	Tank-wag.	Serv. sta.	Inc. tax	tank-wag.
Dallas, Tex.	13.0	15.0	5.0	8.0
Fort Worth	15.0	17.0	5.0	8.0
Houston	14.5	19.0	5.0	8.0
San Antonio	14.0	18.0	5.0	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank-wagon*
Oleum spirits	15.7
V.M.&P. naphtha	16.0
Cleaners' naphtha	15.0
Stanisol	15.0

*Prices include 3-cent Illinois tax but not 1-cent federal tax or 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gallon lots if covered by contract.

Canada*

3-Star Imperial Gasoline

IMPERIAL OIL, LTD.

	Tank-wag.	Inc. tax	Kero. tank-wag.
Halifax, N. S.	23.5	10.0	17.5
St. John, N. B.	23.5	10.0	17.5
Montreal, Que.	20.0	6.0	14.5
Toronto, Ont.	21.0	6.0	15.5
Hamilton, Ont.	21.0	6.0	15.5
Winnipeg, Man.	27.5	7.0	20.7
Brandon, Man.	28.1	7.0	22.9
Regina, Sask.	26.0	7.0	22.0
Saskatoon, Sask.	28.3	7.0	24.9
Edmonton, Alta.	26.5	7.0	21.5
Calgary, Alta.	23.5	7.0	19.0
Vancouver, B. C.	23.0	7.0	23.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent below tank-wagon price. In maritime provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Continental Oil Co. January 27 reduced dealer gasoline 1 cent in Helena; January 28, reduced tank-wagon kerosene 2.5 cents in Roswell, N. M.

Standard Oil Co. (Nebraska) January 31 advanced dealer gasoline in North Platte 1 cent.

New York Market

(Continued from Preceding Page)

vania for 45 water-white kerosene and 36-40 fuel oil was held at 4⅛ cents.

The retail motor fuel situation remained practically unchanged in the northern section last week. Retail prices are demoralized in numerous small points of consumption in northern Pennsylvania, New Jersey, western New York and in scattered sections of New England. The metropolitan New York retail motor fuel market is in stable condition at the moment as is the case in Newark.

Rains followed snow at the end of last week, curtailing normal automobile operation to winter sport centers over the week-end. The winter rain with moderate temperatures had a more serious depressing effect on motor fuel consumption than subfreezing temperatures existing during the last half of January.

Prices of Refined Products

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of February 4, 1939

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
62 octane and below	.03¾	.03½
63-66 octane	.03⅞	.04
67-69 octane	.04⅛	.04¼
70-72 octane (regular)	.04⅜	.04½
60-62 400 grades:		
62 octane and below	.03¼	.03½
63-66 octane	.03⅞	.04
67-69 octane	.04⅛	.04¼
70-72 octane (regular)	.04⅜	.04⅝
64-66 375	.04	.04⅛
68-70 360	.05	.05⅛

NORTH TEXAS—

U. S. Motor grades:		
62 octane and below	.03¼	.03⅜
63-66 octane	.03⅞	.04
67-69 octane	.04⅛	.04¼
70-72 octane (regular)	.04⅜	.04⅝
60-62 400	.03⅜	.03⅝
64-66 375	.04	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
62 octane and below	.04	.04¼
63-66 octane	.04¼	.04½
67-69 octane	.04½	.04¾
70-72 octane (regular)	.04⅞	.05⅛

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
62 octane and below		.04
67-69 octane	.05	.05⅛

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
62 octane and below	.03⅝	.03¾
63-66 octane	.03⅞	.04¼
67-69 octane	.04¼	.04⅜
70-72 octane	.04⅝	.04⅝
60-62 400 grades:		
62 octane and below	.03½	.03¾
63-66 octane	.03⅞	.04⅛
67-69 octane	.04⅛	.04⅜
70-72 octane	.04⅜	.04⅝
64-66 375	.04	.04¼
68-70 360	.05	.05¼

PENNSYLVANIA (inland refineries)—

58-60 U. S. Motor:		
Below 60 octane	.04¼	.04⅜
65 octane		.06¼
68-70 octane		.06½

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.06½	.08
58-60 400, 65 oct. and higher	.07½	.09

EAST COAST (domestic)—

U. S. Motor, 65 and above:		
*New York (Bayonne)	.06	.06¼
Philadelphia	.06	.06¼
Baltimore	.06	.06¼
Charleston, S. C.	.06½	.06¾

*All grades of gasoline one-eighth to one-fourth cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery one-fourth cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
Below 60 octane		.04¼
60-64.9	.04½	.04⅝
65 octane and higher		.04⅝
68-70	.04⅞	.05⅛

Naphtha

PENNSYLVANIA (inland refineries)—

52-56 450 (blending)	.04¼	.04½

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.02½
Grade 18-55		.03

NORTH TEXAS—

Grade 26-70		.02½
Grade 18-55		.03

CALIFORNIA—

75-85 375-390	.06¼	.06¾

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.02⅞

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p., 110-flash, 540-550 e.p.	.03¾	.03⅞
41-43 gr., 300-320 i.b.p., 110-125 flash, 500-520 e.p.	.04	.04¼
46-48 gr., 210-230 i.b.p., 480-max., e.p.	.04⅜	.04⅝

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43	.03⅞	.04
42-44	.04⅛	.04¼

NORTH TEXAS—

41-43	.04	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.04	.04⅜

ARKANSAS (Ark. and N. La. del.)—

41-43		.04½

PENNSYLVANIA (inland refineries)—

45	.04⅝	.04⅞
46	.04¾	.05
47	.04⅞	.05⅛

CHICAGO (Based on Group 3)—

41-43	.03⅞	.04½
42-44	.04⅛	.04⅜

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04¾	.05¾

NEW YORK (Bayonne, N. J.)—

41-43	.04¾	.05

***GULF COAST (domestic)—**

41-43	.03⅞	.04⅛

*Barge price one-eighth cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.03⅝	.03¾
No. 1 prime white, 38-42	.03½	.03⅝
No. 1 straw, 38-40	.03⅜	.03½
No. 2 straw, 32-36	.03¼	.03⅜
No. 2 dark, 32-36	.03⅛	.03¼
No. 3 zero to 15, 28-32	.03	.03⅛
No. 3, 15 and above, 28-32	.02¾	.02⅞

NORTH TEXAS—

No. 1 prime white, 38-42	.03⅝	.03¾
No. 1 straw, 38-40	.03½	.03⅝

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03⅜	.03⅝

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36		.03⅝

CHICAGO (Based on Group 3)—

Range oil	.03⅝	.03¾
No. 1 prime white, 38-40	.03½	.03⅝
No. 1 straw, 38-40	.03⅜	.03½
No. 2 straw, 32-36	.03¼	.03⅜
No. 2 dark, 32-36	.03⅛	.03¼
No. 3, zero to 15, 28-32	.03	.03⅛
No. 3, 15 and above, 28-32	.02¾	.02⅞

NEW YORK (Bayonne, N. J.)—

*No. 1	.04½	.04⅝
*No. 2		.04
*No. 4		.04

*Barge deliveries one-eighth to one-fourth cent under above tankcar price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil	.02⅞	.03⅛
No. 4, low pourpoint, 24-28	1.00	1.10
No. 4, 15 and above, 24-28	.85	.90
No. 5, low pourpoint, 18-22	.70	.75
Below 14 fuel oil, industrial	.50	.60

NORTH TEXAS—

U.G.I. gas oil	.02⅞	.03⅛
No. 4, low pourpoint, 24-28	1.00	1.10
No. 5, low pourpoint, 18-22	.70	.75
Below 14 fuel oil, industrial	.50	.60

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.70	.75

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02¾	.02⅞
No. 4, low pourpoint, 24-28	1.00	1.10
No. 4, 15 and above, 24-28	.85	.95
No. 5, low pourpoint, 18-22	.70	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pourpoint, 10-16	.60	.70
No. 6, 15 and above, 10-16	.35	.45

PENNSYLVANIA (inland refineries)—

36-40	.03¾	.04⅛

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.15	1.35
24 plus Diesel, per bbl.	1.00	1.30
24 plus Diesel (bunkers)	1.15	1.50
12-16 (bunkers at tidewater)	.75	.90
10-16 (cargo lots)	.60	.80
12-17 (tankcars)	.50	.80
10-17 (high sulfur)	.45	.70
San Joaquin Valley:		
10-18 (tankcars)	.50	.80
24 plus Diesel, per bbl.	1.15	1.40
San Francisco:		
24 plus Diesel, per bbl.	1.40	1.45
24 plus Diesel (bunkers)	1.45	1.55
10-16 (bunkers)	.90	.95

GULF COAST—

No. 2 fuel	.03⅜	.03⅝
43-47 Diesel	.03½	.03⅝
48-52 Diesel	.03½	.03⅝
53-57 Diesel	.03⅝	.03¾
Bunker C (bulk cargoes)		.70
Bunker C (bunkers)		.75

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.04¼
28-30 Diesel (lighterage 6¼c per bbl.)		1.65
28-30 Diesel (tankcars)	.04¼	.04½
Bunker C (to ocean-going ships in N. Y. Harbor)		.95
Industrial fuel (tankcars)	.03¾	.04

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

190-200 D, 15-25		.19
150-160 D, 0-10	.14¼	.16
150-160 D, 15-25	.13½	.15½
150-160 E, 15-25	.13	.15
100-110 D, 0-10		.14½
Steam refined:		
631 green (treated)		.12½
600 dark green (untreated)	.04½	.05

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pourpoint	.17	.17½
15 pourpoint	.16	.16½
20 pourpoint	.15	.15½
25 pourpoint	.14	.14½
Steam refined:		
600	.08	.08½
650	.10	.10½
600 Pennsylvania flash	.10½	.11
630 flash	.13½	.14
600 Warren E filtered	.12½	.13

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

150-3		.09
180-3		.10
180-4		.09½
200-3		.10½
200-4		.10
250-3		.11½
250-4		.11
280-3		.12½
280-4		.12
300-6½		.13
400-3½		.14
100-2½ paraffin oil		.06
15-20 pourpoint:		
200-3		.10
200-4		.09½
250-3		.11
250-4		.10½
280-3		.12
280-4		.12½

GULF COAST—

Pale oils:		
200-3	.07	.07¼
300-3	.07½	.07¾
500-3½	.08½	.08¾
750-3½	.08¾	.09¼
1,200-3½	.09½	.09¾
1,500-4	.09¾	.10
Red oils:		
200-5-6	.07¼	.07½
300-5-6	.07¼	.07¼
500-5-6	.08	.08½
750	.08¾	.09
1,200-5-6	.09¼	.09½

CALIFORNIA (moving to dom. market)—

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-3½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pourpoint	.16	.16½
10 pourpoint	.15	.15½
15 pourpoint	.14	.14½
25 pourpoint	.13	.13½
200 vis. at 70° F., 3 color:		
Zero pourpoint	.18	.18½
10 pourpoint	.17	.17½
15 pourpoint	.16	.16½
25 pourpoint	.15	.15½

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (a.m.p.) w.c. scale		.0250

PENNSYLVANIA (inland refineries)—

122-124 (a.m.p.) w.c. scale	.0235	.0245
124-126 (a.m.p.) w.c. scale	.0235	.0245

NEW YORK—

Wax in bags fully refined:		
122-125 (a.m.p.) wax		.0375
125-127 (a.m.p.) wax		.0390
128-130 (a.m.p.) wax		.0400
130-132 (a.m.p.) wax		.0435
133-135 (a.m.p.) wax		.0465
135-137 (a.m.p.) wax		.0490
124-126 (a.m.p.) w.s.		.0230
124-126 (a.m.p.) y.s.		.0230
Petrolatum in barrels, carload lots:		
Dark green	.02	.02¼
Amber	.02¾	.02½
Extra amber	.02½	.02¾
Lily white	.05½	.05¼
Snow white	.06¼	.06¼
Cream	.04¼	.04¼

Export Prices

GASOLINE

GULF COAST—

U. S. Motor	.04⅜	.04½
60-62 400	.04⅝	.04½
61-63 390	.04½	.04⅝
64-66 375	.04½	.04⅝

LOS ANGELES—

U. S. Motor grades:		
55-65 octane	.04½	.04⅝
65-69 octane	.04¾	.05
Above 69 octane	.05	.05½

KEROSENE

GULF COAST—

41-43 prime white	.03⅞	.04⅛
41-43 water white	.03⅞	.04⅛

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbls.)—

Cylinder stocks:		
600 Warren E	.15	.15½
600 S.R. unfiltered	.16	.16½
630 S.R. unfiltered	.17	.17½
600 flash, S.R.	.17	.17½
630 flash, S.R.	.20½	.21
Bright stocks:		
8 color	.16¼	.16½

NEUTRAL OIL

200-3 color	.21½	.22
150-3 color	.19½	.20

PARAFFIN WAX

NEW YORK (prices per pound)—

123-125 a.m.p.		.0375
125-127 a.m.p.		.0387
128-130 a.m.p.		.0412
133-135 a.m.p.		.0437
135-137 a.m.p.		.0455
Crude scale:		
124-126 w.s.	.0235	.0245
124-126 y.s.	.0235	.0245

Crude Oil Prices

Oklahoma, Kansas, North Central and East Central Texas

East Texas (Oct. 11, 1938)* $1.10
Van, Tex. (Oct. 11, 1938)* ..... .93
Talco, Tex. (Oct. 11, 1938)* ..... .55
Rodessa, Tex. .....
See North Louisiana gravity schedule
Cass and Panola counties, Texas .....
See gravity schedule
Altus and Tipton† ..... See note below
Cayuga, Tex. (Oct. 12) ..... .81
Clay Creek, Tex. ..... .85

*Humble Oil & Refining Co. †Gulf Refining Co.

Altus and Tipton, Okla., starting at below 25 degrees at 71 cents, 2-cent spread to 40 degrees and above at $1.03. East Texas price met by all buyers posting prices. Talco price adopted by Talco Pipe Line on October 11. Cayuga posted by Tide Water Associated Oil Co. Clay Creek posted by Sun Oil Co.

Southwest Texas

Salt Flat, Darst Creek, Hilbig, Carroll, Clark and Zoboroski (Oct. 11, 1938)* ..... $ .96
Pettus (Oct. 11, 1938)* 1.29
Flour Bluff (Dec. 3, 1938)* 1.23
Darst Creek (Oct. 12, 1938)† ..... .96
Darst Creek and Bruner (Oct. 13, 1938)‡ ..... .96
Luling (Oct. 12, 1938)† ..... .87
Lytton Spings (Oct. 12, 1938)† ..... .99
Mirando (Oct. 12, 1938)† .....
Government Wells (Oct. 13, 1938) .....
See note below

*Humble Oil & Refining Co. †Magnolia Petroleum Co. Pettus price adopted by Atlantic Crude Oil Purchasing Co. ‡Gulf Refining Co.

Government Wells posted by Sun Oil Co. starts at 20 gravity, 77 cents, 3-cent spread to 24-24.9 at 89 cents.

Gulf Coast

Conroe, Tex. (Oct. 11, 1938)* $1.27
Black Bayou and White Castle, La. (Oct. 11, 1938)† .....
See note below
Gibson, La. (Oct. 11, 1938)† 1.04
Garden Island, La. (Oct. 12, 1938)‡ 1.24
Lafitte, La. (Oct. 12, 1938)‡ 1.04
Cleveland, Tex. (Oct. 12, 1938)¶ 1.14
Hardin, Tex. (Oct. 12, 1938)¶ 1.02
Tepetate, La. (Oct. 11, 1938)§ 1.03
Villa Platte, La. (Oct. 11, 1938)§ 1.03
Abbeville, La. (Jan. 1, 1939)§ .....
See note below
Bosco, La. (Dec. 3, 1938)‖ ..... .93
Creole, La. (Oct. 13, 1938)‖ ..... .96
Gueydan, Sweet Lake, and Louise, La. (Oct. 13, 1938)‖ ..... See note below
Vinton, Edgerly, Starks, Hackberry, Timbalier Bay, Quarantine Bay, and Grand Bay, La. (Oct. 13, 1938)** .....
Long Lake, Tex. (Oct. 13, 1938)** 1.08
Segno and Wing (Oct. 13, 1938)** .....
See note below
Livingston (Oct. 11, 1938)† 1.10
Gibson, La. (Oct. 11, 1938)† 1.04

*Humble Oil & Refining Co. †Shell Petroleum Corp. ‡Texas Co. §Continental Oil Co. ‖Magnolia Petroleum Co. ‖Pure Oil Co. **Gulf Refining Co.

Black Bayou, etc., starts at below 20 degrees at 79 cents; 20-20.9, 81 cents; 21-21.9, 83 cents, then a 3-cent spread to 26-26.9 degrees, 98 cents, and 27 degrees and over $1. Abbeville starts at below 36 degrees, 92 cents, 2-cent spread to 40 degrees and over at $1.02. Gueydan, etc., starts at below 20 degrees, 79 cents, 3-cent spread to 26-26.9 degrees at $1, and 2-cent spread to 40 degrees and over at $1.28. Segno and Wing take Gulf Refining Co.'s Gulf Coast prices. Vinton, Edgerly, etc., schedule starts at below 18 gravity, 76 cents, 2-cent spread to 20-20.9 at 82 cents; then a 3-cent spread to 26-26.9 at $1; then a 2-cent spread to 34 degrees and over at $1.16.

North Louisiana and Arkansas

Smackover, Ark. (Oct. 5, 1938)* ... $ .73
Buckner, Magnolia, and Village, Ark. (Oct. 5, 1938)* .... See note below
Schuler, Jones sand ..... See note below
Tullos and Urania ..... .89
Cotton Valley, La. (distillate) (Dec. 23, 1938)* 1.20
Lisbon, La. (Sept. 19, 1938) .....
See note below

*Smackover posted by Standard Oil Co. of Louisiana, October 5, 1938; by Magnolia Petroleum Co., October 12; by Gulf Refining Co., October 13; McMillan Refining Co. and Cross Refining Co. met price. Tullos and Urania posted by Hunt Oil Co. and Arkansas Fuel Oil Co.

Schuler Jones sand schedule starts at below 25 degrees, 66 cents, with 2-cent spread to 40 and over at 98 cents; by Lion Oil Refining Co. on October 5, 1938; Schuler light Morgan sand crude takes North Louisiana gravity scale along with El Dorado and Champagnolle; by Lion Oil Refining Co., October 5; Buckner, Magnolia, and Village schedules posted by Standard Oil Co. of Louisiana and Lion Oil Refining Co. on October 5; quote same prices as for Schuler Jones sand crude.

Middle Western States

OHIO OIL CO.
(Effective October 13, 1938)

Lima, Ohio ..... $ .90
Illinois old fields 1.05
Illinois basin 1.15
Princeton, Ind. 1.05
Western Kentucky 1.10
Greendale, Porter, and Crystal, Mich. (Jan. 6, 1939)* ..... .92½
Buckeye, Bentley, Edenville, Beaverton, Mich. (Jan. 6, 1939)* ..... .90
Freeman-Redding, Mich. (Jan. 6, 1939)* ..... .82
West Branch and Arenac, Mich. (Dec. 13, 1938)* ..... .70
Allegan (Jan. 6) ..... .78
Bloomingdale (Dec. 19) ..... .84
Muskegon 1.00
Sherman, Mich. (Dec. 13, 1938)‡ ... .82
Eastern Kentucky:
Big Sandy River† 1.12
Kentucky River† 1.20

*Simrall Corp. †Ashland Refining Co. ‡Pure Transportation Co.

Rocky Mountain States

Dry Creek, Wyo. (Oct. 11, 1938)* ... $ .92
Elk Basin, Wyo. (Oct. 11, 1938)*† ... .90
Grass Creek, light, Wyo. (Oct. 11, 1938)*† ..... .90
Grass Creek, heavy (Oct. 11, 1938)† .40
Lance Creek, Wyo. (Oct. 11, 1938)* .77
Rock Creek, Wyo. (Oct. 11, 1938)* .. 1.00
Iles, light, Colo. (Oct. 11, 1938)† .... .98
Iles, heavy, Colo. (Oct. 11, 1938)† .... .92
Dutton Creek, Wyo. (Oct. 11, 1938)† .....
See note below
Frannie, light, Wyo. (Oct. 11, 1938)† .55
Frannie, heavy, Wyo. (Oct. 11, 1938)† ..... .42
Hamilton dome, Wyo. (Oct. 11, 1938)† ..... .35
Midway, Wyo. (Oct. 11, 1938)† .....
See note below
Salt Creek Tensleep crude, Wyo. (Oct. 11, 1938)† ..... .646
Salt Creek (Oct. 11, 1938) See note below
Canon City, Colo. (Oct. 11, 1938)‡ .. .90
Florence, Colo. (Oct. 11, 1938)‡ 90
Cat Creek, Mont. (Oct. 11, 1938)‡ .. 1.10
Big Muddy, Wyo. (Oct. 11, 1938)‡ .. .98
Lance Creek, Wyo. (Oct. 11, 1938)‡ . .77
Lea County, N. M. .....
See West Texas gravity schedule‡
Artesia, Jackson and Maljamar .....
See gravity table‡
Fort Collins and Wellington, Colo. .....
See gravity table‡
Eddy County, N. M. (October 11, 1938)¶ ..... .77

*Ohio Oil Co. †Stanolind Oil & Gas Co. ‡Continental Oil Co. ¶Sinclair Prairie Oil Marketing Co.

Dutton Creek and Salt Creek Tensleep crude start at below 29 degrees, 86 cents, 2 cents spread to 40 and over at $1.10. Salt Creek crude excepting Tensleep, takes Standard Oil Co. of Indiana Oklahoma-Kansas prices. Stanolind Oil & Gas Co., effective October 11, discontinued posting prices in Greybull-Torchlight, Wyo., and Hogback and Hospah, N. M.

Eastern States

SOUTH PENN OIL CO.
(Effective February 1, 1939)

Pennsylvania Grade Oil in National Transit Lines (Bradford field) .. $1.88
Pennsylvania Grade Oil in Southwest Pennsylvania Lines 1.53
Pennsylvania Grade Oil in Eureka Pipe Line lines 1.47
Pennsylvania Grade Oil in Buckeye Pipe Line lines 1.45
Corning Grade Oil in Buckeye Pipe Line Co. line (Jan. 24) 1.02

TIDE WATER ASSOCIATED OIL CO. and NEW YORK TRANSIT CO.
(Effective February 1, 1939)

Bradford, Pa. $1.88
Allegany, N. Y. 1.88

PENNZOIL CO.

Group A $1.83
Group B 1.82
Group C 1.81
Group D 1.80
Group E 1.78

PURE OIL CO.
(Effective February 1, 1939)

West Virginia $1.47

West Texas

See gravity table.
Pecos County (Oct. 11, 1938)* ..... $ .78
Pecos shallow (Oct. 11, 1938)† ..... .65
*Shell Petroleum Corp., Gulf Pipe Line Co. and Humble Oil & Refining Co. †Shell Petroleum Corp.

Canada

Ontario (Oct. 25, 1938)*

Petrolia $1.90
Oil Springs 1.97

TURNER VALLEY
(January 5, 1938, by Imperial Oil, Ltd.)

Clear naphtha and discolored naphtha, 65 gravity and higher $2.14
Discolored naphtha and crude oil, 40-40.9 gravity 1.14
Increasing 2 cents for each degree gravity with top price for 64-64.9 gravity 1.62
These prices f.o.b. producers field tank age.
*Imperial Oil, Ltd.

Crude Oil Price Changes

Effective February 7 at 7 a.m., Phillips Petroleum Co. revised upward its price schedule for "sweet" and "sour" crudes in the Texas Panhandle. For sweet crude the company pays 72 cents for below 29 gravity, adding 2 cents for each degree upward to and including 40 and above at 96 cents. For sour crude the price is 5 cents less per barrel, starting at 67 cents for below 29 and adding 2 cents for each degree upward to and including 40 and over at 91 cents. County lines are not considered by the company in making the above schedules, but the prices are the same as those posted by Humble Oil & Refining Co. for Gray County and for Carson and Hutchinson counties, effective December 3, 1938.

Elements of Fractional Distillation

The third edition of "The Elements of Fractional Distillation" has been made available by the authors, Clark Shove Robinson and Edwin Richard Gilliland, associate professors of chemical engineering at Massachusetts Institute of Technology. The popularity of the previous editions guarantees the favorable reception of this edition, particularly since the later edition includes the basic distillation studies and the more recent practices to make it the most modern and practical summary of distillation studies now available.

In the treatment of binary mixtures, the methods of Sorel, McCabe and Thiele, Ponchon, Savarit, Lewis, Smoker, and Fenske are considered and illustrated by several numerical examples.

Multicomponent rectification is represented by the work of Lewis and Matheson, Lewis and Cope, Brown and associates, and Underwood. In several cases the methods of the above workers have been simplified in order to make them easier to use. Methods for predicting the minimum reflux ratio and optimum feed-plate location for these mixtures are developed and presented. Several numerical examples are given in detail in order to aid the reader in calculations of this type.

The performance of plate and packed towers has been considered on the basis of plate efficiencies, pressure drop, allowable liquid and vapor rates, and so forth, making use of the data of numerous investigators.

"Elements of Fractional Distillation" may be purchased through the Book Department of The Oil and Gas Journal at the established retail price of $3.00, express prepaid (postage extra outside the United States), and a copy will be forwarded promptly upon receipt of check or money order for that sum. Where payment or company purchase order is not provided, the book will be sent c.o.d. to avoid delay.

Crude Prices by Gravities

	1 Oklahoma	2 Oklahoma and Kansas	3 North and Central Texas	4 Louisiana and Arkansas	5 East Central Texas	6 Gray County, Texas	7 Hutchinson and Carson counties, Texas	8 Raccoon Bend, Satsuma and Tomball, Texas	9 West Texas and Lea County, N. M.	10 Fort Collins and Wellington, Colo.	11 Anahuac and Dickinson, Texas	12 Refugio, Texas	13 Mirando and Duval Texas	14 Gulf Coast Texas	15 Cass and Panola counties, Texas	16 Beaumont and West Beaumont, Texas	17 Lockport, Iowa, Cameron Meadows, Louisiana	18 Artesia, Jackson, and Maljamar, N. M.	19 Iowa, Louisiana
Below 18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	$.74	....	$.75
18-18.9	....	....	....	....	....	....	....	....	$.53	....	$.74	$.79	$.74	$.79	....	....	.76	....	.77
19-19.9	....	....	....	....	....	....	....	....	.53	....	.74	.79	.74	.79	....	$.79	.78	....	.79
20-20.9	$.60	$.70	....	....	....	....	....	....	.55	....	.77	.82	.77	.82	....	.82	.80	....	.81
21-21.9	.63	.72	....	....	....	....	....	....	.57	....	.80	.85	.80	.85	....	.85	.82	....	.83
22-22.9	.66	.74	....	....	....	....	....	$.95	.59	....	.83	.88	.83	.88	....	.88	.85	....	.86
23-23.9	.69	.76	....	....	$.78	....	....	.97	.61	....	.86	.91	.86	.91	....	.91	.88	....	.89
24-24.9	.72	.78	$.71	....	.80	....	....	.99	.63	....	.89	.94	.89	.94	....	.94	.91	....	.92
Below 25	....	....	....	$.73	....	....	....	....	....	....	....	....	....	....	$.73	....	....	....	....
25-25.9	.75	.80	.73	.75	.82	....	....	1.01	.65	....	.92	.97	.92	.97	.75	.97	.94	....	.95
26-26.9	.78	.82	.75	.77	.84	....	....	1.03	.67	....	.95	1.00	.95	1.00	.77	1.00	.97	....	.98
27-27.9	.81	.84	.77	.79	.86	....	....	1.05	.69	....	.97	1.02	.97	1.02	.79	1.02	.99	....	1.00
28-28.9	.84	.86	.79	.81	.88	$.72	$.67	1.07	.71	$.81	.99	1.04	.99	1.04	.81	1.04	1.01	$.61	1.02
29-29.9	.87	.88	.81	.83	.90	.74	.69	1.09	.73	.83	1.01	1.06	1.01	1.06	.83	1.06	1.03	.63	1.04
Below 30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
30-30.9	.90	.90	.83	.85	.92	.76	.71	1.11	.75	.85	1.03	1.08	1.03	1.08	.85	1.08	1.05	.65	1.06
31-31.9	.92	.92	.85	.87	.94	.78	.73	1.13	.77	.87	1.05	1.10	1.05	1.10	.87	1.10	1.07	.67	1.08
32-32.9	.94	.94	.87	.89	.96	.80	.75	1.15	.79	.89	1.07	1.12	1.07	1.12	.89	1.12	1.09	.69	1.10
33-33.9	.96	.96	.89	.91	.98	.82	.77	1.17	.81	.91	1.09	1.14	1.09	1.14	.91	1.14	1.11	.71	1.12
34-34.9	.98	.98	.91	.93	1.00	.84	.79	1.19	.83	.93	1.11	1.16	1.11	1.16	.93	1.16	1.13	.73	1.14
Below 35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
35-35.9	1.00	1.00	.93	.95	1.02	.86	.81	1.21	.85	.95	1.13	1.18	1.13	1.18	.95	1.18	....	.75	....
36-36.9	1.02	1.02	.95	.97	1.04	.88	.83	1.23	.87	.97	1.15	1.20	1.15	1.20	.97	1.20	....	.77	....
37-37.9	1.04	1.04	.97	.99	1.06	.90	.85	1.25	.89	.99	1.17	1.22	1.17	1.22	.99	1.22	....	.79	....
38-38.9	1.06	1.06	.99	1.01	1.08	.92	.87	1.27	.91	1.01	1.19	1.24	1.19	1.24	1.01	1.24	....	.81	....
39-39.9	1.08	1.08	1.01	1.03	1.10	.94	.89	1.29	.93	1.03	1.21	1.26	1.21	1.26	1.03	1.26	....	.83	....
40 and over	1.10	1.10	1.03	1.05	1.12	.96	.91	1.31	.95	1.05	1.23	1.28	1.23	1.28	1.05	1.28	....	.85	....

New or Improved Equipment

National Offering Combination to Set Long Casing Strings

The increasing depth of wells has created a need for a fast and yet safe means of setting extra-long strings of casing. The combination of the Ideal automatic grip elevator and spider has been successfully used for many years in setting long strings of casing. The National Supply Co. now offers the Type S extra-heavy elevator and hinged spider (patented) in anticipation of even longer strings of casing.

The Type S elevator and hinged spider have a rated capacity of 400 tons. Extra-long full-circle slips for handling the heavy strings of casing without crimping the pipe are features of both. Being of the hinged type, the spider may be put on or taken off easily at any time. The hinged construction also permits the use of mandrel suspension-type casingheads whose mandrel will not pass through the closed spider.

Designed primarily for strength and safety,

the automatic grip elevator and spider have proven features of speed and convenience that appeal to all operators. They grip the casing without contacting the coupling, making them adaptable for either collared casing of flush-joint casing.

The Type S elevator and hinged spider are a safety combination with which the manufacturer says it is impossible to drop the casing, because the slips of either unit cannot be released until the load is taken by the other. The slip release is positive in action, maintaining the slips in a vertical position and thus minimizing the chance of the pipe coupling hanging up on the slips.

Bulletins, Booklets, and Other Literature for the Trade

The current number of Nickel Cast Iron News, published by the International Nickel Co., 67 Wall Street, New York, devotes two illustrated pages to "The Role of Nickel Cast Irons in the Petroleum Industry."

Graver Tank & Manufacturing Co., East Chicago, Ind., is sending to those who ask for it a convenient scale giving vertical tank capacities and temperature correction for Brix spindle.

An 8-page bulletin from Joseph T. Ryerson & Son, Inc., Sixteenth and Rockwell Streets, Chicago, explains the physical structure of Glyco babbitt with its homogeneity and uniformity of quality, prime characteristics of a good bearing metal. Included are recommended applications for the various grades of Glyco carried in Ryerson stock.

Among interesting articles in the latest issue of the Water Tower, published by the Chicago Bridge & Iron Co., Old Colony Building, Chicago, is one describing installation of the Wiggins balloon system at the Shell Oil Co.'s Dominguez refinery.

A 35-page booklet obtainable from the Cleveland Tractor Co., Cleveland, Ohio, discusses features of Cletrac crawler tractors, which are designed to give trouble-free performance and long life.

A new motor application chart is mailed on request to the Louis Allis Co., Milwaukee, Wis. It lists 26 types of motors and checks the proper type of motor recommended for about 50 standard applications.

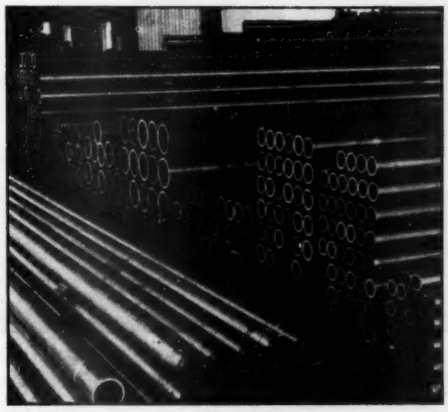
A 48-page illustrated engineering data book, No. 1645, has been published by Link-Belt Co. on its Silverstreak silent chain and Silverlink roller chain drives for automotive and stationary engines (timing and accessory driving). The data will be found useful in designing drives for gasoline, oil, Diesel, and steam engines, and in laying out driving connections.

The value of chromium-molybdenum steel as shaft material in heavy-duty winches for use in the oil field is discussed in the current number of the Moly Matrix, published by Climax Molybdenum Co., 500 Fifth Avenue, New York.

Fluor gas cleaners are the subject of an eight-page bulletin, in color, published by Fluor Corp., Ltd., Box 128, Arcade Station, Los Angeles, Calif. The bulletin describes the company's improved new-type gas cleaners.

First Carload of "Securaloy"

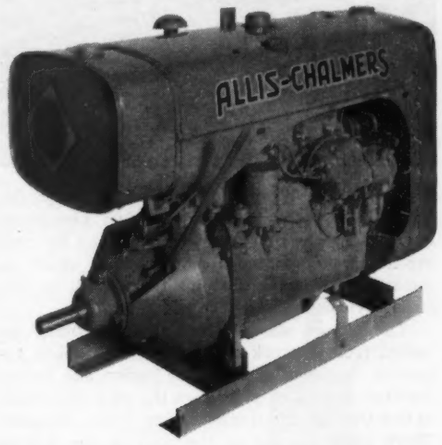
The picture shows part of the first full carload of "Securaloy" pipe delivered at Houston, Tex., by the Security Engineering Co., Inc., Whittier, Calif.



The carload, consisting of pipe in all the popular sizes, was the first of a series consigned to Houston to meet the requirements of Gulf Coast and Mid-Continent operators.

Allis-Chalmers Power Engine Is Adapted for Oil-Field Use

A new power engine, the Model B, announced by Allis-Chalmers Manufacturing Co., Milwaukee, Wis., is particularly adapted to small-type oil-field



power applications. It has 74 foot-pounds torque at 1,100 r.p.m. It is a four-cylinder engine, with 3¼-inch bore and 3½-inch stroke, with piston displacement of 116 cubic inches. This engine features the same removable sleeves that are said to have proved successful on the larger sizes of Allis-Chalmers engines. Reboring is eliminated. There is lubrication under pressure to all working parts, and water circulation is attained by a high-velocity pump. The equipment includes carburetor, oil-wash air-cleaner, high-tension magnet and dry disc clutch, complete with radiator, fan, hood and side plates. Gasoline or natural gas may be used as fuel. The oil-field representative is Fred E. Cooper, Tulsa. The company has branches in Longview, Tex., and Los Angeles, Calif.

Mid-Continent Sales Manager

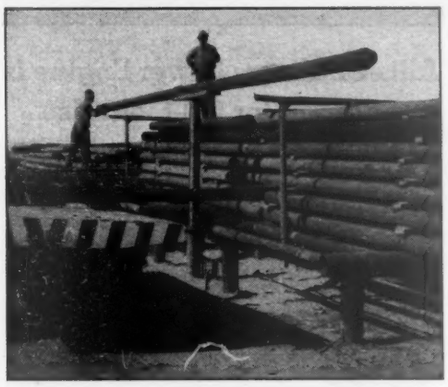
Fred J. Spurlock has been appointed sales manager for the Mid-Continent Supply Co., Fort Worth, Tex. Mr. Spurlock is well known in the petroleum industry, having had wide and varied experience in the oil well supply business. He has been connected with the Mid-Continent Supply Co. for many years in various capacities. In his most recent assignment he was in charge of the company's pumping equipment division. Mr. Spurlock has moved to Fort Worth where he will maintain headquarters in the company's general offices in the Mid-Continent Building.

Polk Goes to California

C. A. Polk, formerly district representative for Well Equipment Manufacturing Corp. in North Texas, is now representing that company on the Pacific Coast, with headquarters at 245 Corona Avenue, Long Beach, Calif. WECO recently appointed Petroleum Equipment Co., Los Angeles, as California distributor, and this West Coast connection prompted the transfer of Mr. Polk.

Handling of Drillpipe or Casing Lightened by Wosco Loader

A device to speed up and facilitate the loading and unloading of drillpipe and casing has been



developed by Western Oil Fields Supply Co., Bakersfield, Calif. The Wosco safety pipe-loader employs an air- or steam-operated hoist for raising the pipe onto hinged tubular skids, which automatically transfer the pipe from truck to rack or vice versa.

The picture shows 6-inch drillpipe being unloaded from a truck and piled 8 feet above the ground. One man operates the loader, and he can transfer 16 tons of pipe from the rack to a truck in less than 20 minutes according to the company. There being no one in the path of the moving pipe, the safety factor is described as absolute.

The original Wosco loader has been in operation at the pipe-rack in the Western Oil Fields Supply yard since last April. It has loaded 200,000 feet of pipe, with no repairs required.

Bethlehem-International Office Now Established in Houston

C. A. Tompson, vice president and general manager of Bethlehem-International Supply Co., subsidiary of Bethlehem Steel Corp., has announced that the company's headquarters for the southern division have been established in Houston, Tex. C. C. Crider, manager of the southern division, who formerly resided in Dallas, Tex., now has his office in Houston, with supervision over Bethlehem-International's activities in Texas, Louisiana, Arkansas, and New Mexico.

E. F. Seaman continues in Houston as manager of the Gulf Coast district. Van D. Bennett, sales engineer, formerly in the Tulsa office, also maintains headquarters in Houston. T. R. Miller and A. B. Harrison complete the city sales organization. The Houston store of Bethlehem-International is in charge of C. H. Peters. C. V. Calma continues as superintendent of the Houston pipe yard.

The Bethlehem-International Supply Co. represents a consolidation of the Bethlehem Supply Corp. and International Supply Co. The acquisition of International Supply Co., long identified with the oil-field supply business, by the Bethlehem Steel Co., represents a continuation of Bethlehem's program of expansion in the oil-field supply business. The new company will handle a complete line of tubular products, sucker-rods, wire lines, drilling equipment, pumping equipment, and all other oil-field materials.

Bethlehem recently completed extensive additions to its facilities in Houston as a result of establishing a mill stock for tubular products. The further concentration of operations for the southern division in Houston necessitates enlargement of Bethlehem's office building and the company contemplates an immediate addition to its building at 7100 Clinton Drive.

Longer Life for Belt Is Gained by Shock-Absorbing Cushion

Improved conveyor-belt construction, embodying a feature designed to withstand unusually severe service conditions, is announced by the Mechanical Goods Division of the United States Rubber Co. The improvement, engineers explain, is accomplished by imbedding a special-weave breaker-strip fabric in a heavy layer of soft white gum. This layer, inserted next to the belt carcass as an integral part of the belt cover, provides a shock-absorbing cushion for the cover.

Because of its ability to absorb the shock of heavy impact, this new type of construction increases the effectiveness of the cover in resisting the gouging, snagging and other severe wear encountered in heavy service. In addition to the increased cover life thus obtained, extra protection is said to be provided for the belt carcass due to the ability of this white breaker-insert to withstand and cushion the blows of heavy material.

Important Improvements Made in Explosion-Proof Motor

A new line of both alternating- and direct-current explosion-proof motors is announced by the Louis Allis Co., Milwaukee, Wis. The motors are designed especially for use in plants where explosive materials are manufactured or handled, such as oil refineries, gasoline plants, chemical

and paint factories, etc. According to the company they make possible a new high in electric motor dependability, convenience, long life, and safety.

Eighteen separate mechanical and electrical improvements, some of them exclusive and patented features, are said to be incorporated in the line. The new streamlined motor was designed in collaboration with a well-known industrial stylist.

In announcing the product, described in a booklet, No. 508E, the company draws attention to the fact that 10 years ago it introduced a type of motor which it says effected marked changes in manufacturing processes of various industries, eliminating fire-walls, increasing production, lowering costs, decreasing insurance rates, and creating a margin of safety for both property and life.

Hiller Transferred to Tulsa

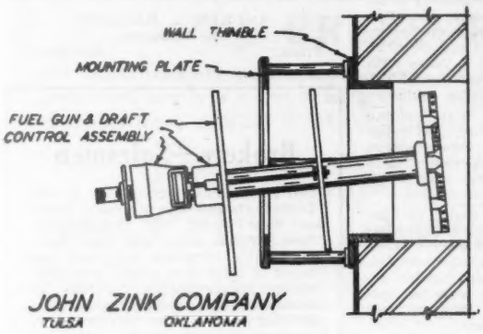
Russell D. Hiller, Jr., has been transferred to Tulsa from the Magnolia division of the Air Reduction Sales Co. in El Paso, Tex. Having spent several years in the Permian Basin field Mr. Hiller has many friends in the oil industry in Oklahoma and other fields. He will make his headquarters at the Air Reduction Sales Co. offices at 10 North Cheyenne Avenue, Tulsa.

GUIBERSON FIELD REPRESENTATIVES MEET TO DISCUSS SALES PLANS FOR 1939

Guiberson Corp. sales force, gathered at the company's main offices, Dallas, Tex., to discuss the company's 1939 sales campaign. Standing, I. H. Buck, pump division, sales engineer; Frank Denman, Jr., representative eastern states including Illinois and Michigan; A. J. Broan, pump division, service engineer; J. C. Owen, representative, West Texas and New Mexico; N. H. Anderson, representative, Central West Texas, Panhandle, and western Oklahoma; C. L. Forcum, representative, South and Southwest Texas; W. B. Osborn, gas-life division; Carleton Clymer, representative, Rocky Mountain states; M. T. Kappele, representative, Kansas and eastern Oklahoma; Gordon G. Guiberson, sales manager. Lower row: E. D. McMurry, representative, Louisiana division, service engineer; H. U. Garrett, assistant sales manager; H. F. Parish, Jr., gas-lift division; L. C. Wigton, representative, eastern states, including Illinois and Michigan. Absent: R. D. Taylor, Jr., gas-lift division.

Combined Oil and Gas Burner Designed for Refinery Units

The John Zink Multi-Way burner, a combination oil and gas burner designed to serve the combustion needs of refinery units, has a frame designed to carry the working parts of any of the types of refinery burners manufactured by John Zink Co. This frame has a steel flange for bolting



to a furnace front. Into it will fit the working parts of Series Y, Z, BMY, BMZ, BMD (dual-aspirator type), and HBM (single-aspirator type) burners.

The Multi-Way is manufactured in seven different diameters. The approximate capacities, with .15-inch draft loss through the burner, range from the 18-inch size, 8,000,000 B.t.u./hr., to 30-inch size, 22,000,000 B.t.u./hr. Beginning with the 18-inch, the diameters increase by 2-inch gradations.

By unbolting a center flange that carries the working parts, as shown on the diagram, the plant operator is able to switch from one type to any other. All are combination burners and will burn with a short flame.

Emsco Founder Continues Active

E. M. Smith, founder and former president of the Emsco Derrick & Equipment Co., who recently disposed of his own and interests of others to the Youngstown Sheet & Tube Co. for more than $2,500,000, announces that he will continue to be active in the oil equipment industry and will retain his many contacts with oil people throughout the world. For the present he will be located at E. M. Smith Co.'s branch office at 1121 Rothwell Street, Houston, Tex., where the company maintains warehouse facilities with complete stocks of the full line of Grizzly products for distribution to the Mid-Continent and Gulf Coast oil fields.

Here and There With Men Who Manufacture Equipment

J. E. DeLong, president, and J. G. Swain, general sales manager of the Waukesha Motor Co., are making a tour of oil fields in Illinois, Kansas, Oklahoma, and the Gulf Coast. Arch F. Campbell, Mid-Continent district representative, is supervising the tour.

The Industrial Division of Wailes Dove-Hermiston Corp., New York, has appointed Robinson, Cary & Sands Co., St. Paul, Minn.; Stokes Engineering & Supply Co., Easton, Pa.; Strong, Carlisle & Hammond Co., 1392 West Third Street, Cleveland, Ohio; and the C. W. Marwedel Co., 1235 Mission Street, San Francisco, as distributors of the Bitumastic line of maintenance protective coatings.

W. H. Johnson, formerly purchasing agent for the Climax Engineering Co., Clinton, Iowa, has been appointed purchasing agent for Foote Bros. Gear & Machine Corp., Chicago.

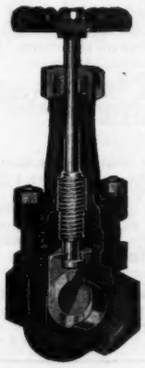
Edward Valve & Manufacturing Co., Inc., East Chicago, Ind., has appointed representatives as follows: W. E. Bowler, Witherspoon Building, Philadelphia, Pa., in the Philadelphia and Wilmington districts; and Frank W. Hoyt, Waverly, Pa., in the Scranton, Easton, Bethlehem, Reading, York, and Harrisburg districts.

Lloyd G. Ensign, export representative for Hercules Tool Co., recently conferred with executives of the company in Tulsa. In addition to analyzing export sales possibilities for a number of new Hercules oil well specialties, Mr. Ensign visited the company's plant before returning to his office in New York.

W. H. Davison, factory representative for Axelson Manufacturing Co., Los Angeles, has been transferred from Oklahoma City to Arkansas City, Kans., to represent Axelson in northern Oklahoma and southern Kansas.

Fluids Flow Back Into Body of Valve When Piping Ceases

The new O.I.C. Duo-Bolt gate valve, inside screw, rising stem, solid wedge, for 150-pound SWP in the screwed end, and 125-pound SWP in the flanged end, can be furnished in bronze mounted or all iron by the Ohio Injector Co., Mansfield, Ohio. This sturdy U-bolt is replaceable with the company's stock bolt, or it can be furnished with either the U-bolt or stock bolt for standard equipment. (That is how the valve derived its name "Duo-Bolt.")



O.I.C. engineers have perfected a tough paint with an elastic binder which, according to the company, will not crack with expansion and contraction of the metal. This paint is an armored coating which insures protection of the exterior of the valve against acid fumes, salt, alkalines, etc. The interior is especially treated to make it rust-proof. A highly important feature of this valve, shown in the illustration, is the large drain duct built in the bonnet to allow fluids to flow back into the body when piping operation is discontinued.

New-Type Tool Available for Pulling Hard-Surfaced Liner

A new-type liner-puller has been announced by MacClatchie Manufacturing Co., Compton, Calif., especially designed for pulling hard-surfaced liners, upon which slip-type pullers will not grip. This new tool, the Universal, is built of steel, heat-treated to withstand severe usage, and is furnished in two sizes for pulling all sizes and makes of pump-liners.

Operation of the Universal liner-puller is simple. The puller legs, mounted on a long bolt, are designed so that, when pushed through the liner, they automatically engage on the end of the liner. The yoke then is adjusted over the cylinder-head studs, and tightening the combination nut places a strong, steady pull on the liner.

The tool contacts the inside of the liner only when the legs are being pushed through to the end for setting. It will not harm the finished surface of any liner, the manufacturer says, an important feature when pulling only partly worn equipment. The tool is equipped with a roller thrust bearing that reduces friction and permits easier turning.

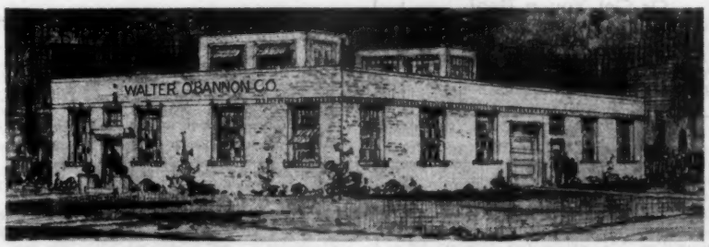
Titeseal Affords Effective Seal Against Water, Steam, Oil

Titeseal, sealing ally of the aviation industry, is now manufactured by the Radiator Specialty Co., of Charlotte, N. C.

This product is a flexible, nonhardening compound which seals gaskets and joints against water, steam, gas, oil, grease and antifreeze leaks. It may be used as a gasket where tolerance permits, with gaskets, as a threaded joint dressing, as a filler with packings, as a special insulation material, as a rust and corrosion preventive. Titeseal is nonsolvent, heat-proof, and allows easy disassembly, as it never hardens. According to the manufacturer, it is unaffected by heat or cold.

NEW O'BANNON PLANT IN FORT WORTH NOW OPERATING

The Walter O'Bannon Co., manufacturer of oil well pumping equipment, recently completed construction of a branch plant at 2500 West Hickery Boulevard, Fort Worth, Tex. The new plant, now in operation, contains one of the company's manufacturing units as well as a complete stock of pumps and pumping equipment for immediate shipment. Personnel includes Ed Franklin, in charge of the office; Virgil Yeager, in charge of the stockroom and shipping department, and Walter O'Bannon, Jr., in charge of sales. The last-named has made Fort Worth his headquarters for over a year. The company stresses the importance of 24 hours' earlier delivery of shipments to points in New Mexico, Texas, Louisiana, and Arkansas.



CLASSIFIED ADVERTISING

Patent Attorneys

JACK A. SCHLEY
PATENT LAWYER

Patents obtained — infringement practice in all Courts—oil field experience. 1807-11 Tower Petroleum Bldg., Dallas. 2014 Second Nat'l. Bank Bldg., Houston. 707 Insurance Building, San Antonio. 433 Munsey Building, Washington, D. C. Address any of these offices.

PATENTS — TRADE MARKS

All cases submitted given personal attention.
Form **"Evidence of Conception"** with instructions for use and **"Schedule of Government and Attorneys' Fees—FREE**
LANCASTER, ALLWINE & ROMMEL
Patent Law Offices
418 Bowen Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

DRILLING deals wanted 50,000 acres Southern Illinois in and around production area. Elmer Gant, Anna, Illinois.

ILLINOIS 60,000 acres in and near production. Illinois Minerals Company, Cairo, Illinois.

SACRIFICE 40-acre Oil Lease, Chaves County, for only $10.00, full price. Guarantee title. P. O. Box 191, Clovis, N. Mex.

320 ACRES, Crane Co., Tex., Magnolia lease, cheap in fee. Address 415 Littlefield Building, Austin, Texas.

OIL and Gas Lease For Sale. My one-half interest in 204 A. Sec. 7. 4N. 6W. Grady Co., Okla. Also, 240 A. Sec. 14 and 15, 2N. 4W. Stephens Co., Okla. E. E. McDowell, Verden, Oklahoma.

5 ACRE Mineral Deed, Landowners Royalty under entire 80 acres of land leased to **Gulf Oil Co. being N½ NW¼ sec. 30, twp. 14s, rge. 31e, full price only $32.50. Perpetual and full participating. Send your check. Guarantee delivery. P. O. Box 968, Hobbs, N. Mex.**

OWNERS offer subject to prior sale oil and gas lease on 480 acres sections 11, 12, 13, 14 Limestone County survey Montague County, Texas five or ten year term at $5.00 per acre eight miles southeast Gant production. G. A. W. c/o First National Bank, Saint Jo, Texas.

FOR SALE: 50-Section Eastern New Mexico Ranch. Oil possibilities. Robert Gray, O'Dell Hotel, Hot Springs, N. M.

WILL GIVE solid 600 acre block leases Breckenridge County, Kentucky for test well 1,250 feet deep or McClosky sand if productive anticipated at lesser depth. Address Owner. GUY J. STUMPFF, Box 1657, Fort Worth, Texas.

WILL GIVE genuine psychic maps showing drilling sites MONTGOMERY COUNTY, MISSISSIPPI to operator who will drill. Texas operators leasing near Kilmichael, Miss. Ideal shore line structure found, 4 oil sands less than 3,500 feet. No proration. Box 303, Memphis, Tenn.

We Can Turn Your Oil Deal Or Get You a Deal

We like the big ones best. Save commissions. Send no information. Just your name and address to: THE BROKER, 906 Tulsa Loan Building, Tulsa, Oklahoma.

IF YOU wish to buy or sell fee lands, leases, royalties, blocks, Wilcox-Sparta trend, La., Tex. State details, price. Pat Casey, Hotel Bentley, Alexandria, La., or Esperson Bldg., Houston, Texas.

320 ACRES NE Ellis Co. Kans. land under nose of oil pool, potentials 22 wells over million bbl. crude per month; sell fee title with 100% oil and gas.
OWNER
4263 W. 58th Place, Los Angeles, Calif.

Leases and Drilling Blocks

NEW MEXICO
State Oil and Gas Leases
Forty acres and multiples thereof at $6.00 to $30.00 per forty in the Hot Spots. Buy where the major companies own leases. Write for list. Twenty years in the business and not a complaint.
HARRY S. WRIGHT
New Mexico State Lessee, P. O. Box 166, Council Bluffs, Iowa, or P. O. Box 347, Santa Fe, N. M.

LEASES—ROYALTIES near Ordovician and Woodbine-Trinity sand wildcats. Quick plays for 50 to 1 chances. E. CROFT, PROCTOR, TEXAS.

WANTED—Tex., La., Okla., Ark. producing or wildcat royalties, leases, from owners or brokers. Give full details, price. American Investment Co., Houston, Texas.

OWNER thousand acres of E. Okla. productive coal oil gas land; $15 fee, half cash, bal. in royalty, or $5 per a. lease or royalty. J. E. Cavanagh, Baker, Oregon.

PARTY now conducting special geophysical exploration surveys for oil promise is often in contact with drilling block opportunities, leases, production, royalties and sometimes capital for development where favorable conditions exist. P. O. Box 364, Fort Worth, Texas.

I HAVE 1200 acres in shallow field Miami Co. near pipeline. Both oil and gas production within a mile. Need Financing. R. FITCH, Paola, Kansas.

WANTED: Partially developed or offset leases for immediate drilling. New Mexico preferred. Send full information to Box J-860, The Oil and Gas Journal, Tulsa, Oklahoma.

HOT SPOT LEASES
North Mo. $1.50 acre up. Some mile of well. Box 152, Milan, Missouri.

FOR SALE: 1200 Acre Illinois block of leases along known structure, 7 miles south of production. Address
Box J-862
The Oil and Gas Journal, Tulsa, Okla.

ILLINOIS
OIL LEASES
20,000 acres from land owners to us. Want promoters, brokers, salesmen to raise drilling funds. Write for locations and our deal. ROZE OIL CO., INC., 508 Insurance Exchange Bldg., St. Louis, Missouri.

Financing

CAPITAL SEEKERS—Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

Situations Wanted

DESIRE connection with company or individual developing oil property, operation or installation of natural gas plant as employee or partner. Graduate engineer, 20 years' operating experience, 4 years with state service Comm. Address Box J-832, The Oil and Gas Journal, Tulsa, Okla.

ACCOUNTANT and Tax man holding C.P.A. degree, desires position, preferably with oil company in Tulsa. Now engaged in public practice. 20 yrs. experience. Reliable refs. furnished. Address Box J-791, The Oil and Gas Journal, Tulsa, Okla.

REFINERY Supervisor and Chemist. Technically trained and experienced in atmospheric, pressure, combination, lubes, wax, treating, chemical and experimental. Management experience. Can furnish reliable references including present employer. Address Box J-852, The Oil and Gas Journal, Tulsa, Oklahoma.

MAN, 27, desires connection with land, lease dept. or operator. Legal education and experience. Address Box J-864, The Oil and Gas Journal, Tulsa, Oklahoma.

Help Wanted

WANTED: Manufacturers' Representative with experience in selling Valve Cups. Must be active and have goon connections with western supply stores and oil companies. Give full particulars. Address Box J-861, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Salesman, experienced in selling pumping units and surface equipment, to fill the position of Sales Manager. Address Box J-865, The Oil and Gas Journal, Tulsa, Okla.

Mailing Lists

ROYALTY Lists. Unit Owners Lists Stockholders Lists. By states. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa Oklahoma.

For Sale—Maps

UP-TO-DATE
County ownership and oilfield maps in TEXAS and NEW MEXICO. WILDCAT MAP of Texas and eastern N. M. published monthly, shows all wildcats drilling in relation to proven fields. Single copy $3.00. Subscription rates.
ZINGERY OIL MAP COMPANY
Fair Bldg. Fort Worth, Tex.

WEST TEXAS HANDY OIL MAPS
Complete coverage on all West Texas Fields, showing operators, farm names, total depths and exact well locations. $10 per month. Individual maps 50 cents each. Box 2519, Tulsa, Oklahoma.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Inquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

Producing and Non-Producing
OIL ROYALTIES
Registered Dealers Only.
GRIMES ROYALTY CO.
Hunt Bldg. Tulsa, Okla.

PRODUCING OIL ROYALTIES
15 years of experience.
L. H. WITWER
703 Kennedy Bldg., Tulsa, Okla.

WILL BUY non-producing landowners royalty—under drilling wells only. P. H. HAWLEY, 727 W. 7th St., Los Angeles, Calif.

Survey Service

OIL FINDING DOWSING METHOD
My deductions a practical method which picks up vibratory reactions emanating from carbo-hydrates. Physico method finds oil, locates faults. Same method discovered great East Texas field also our Watson #2 first producer Wilmington, Calif. field. Employ a man that owns producing wells I find oil if it exists or no charge. George Miller, 1548 Post, Torrance, California.

Legal Blanks

SINCE 1908 Burkhart's legal forms—serving Mid-Cont. oil fields, including Ill., La. Mo. Ind. & Ky. Free catalog & samples. Burkhart Ptg. & Sta. Co., 115 So. Cinn., Tulsa, Okla.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Drilling Contractors

NORTHWEST Missouri—We have light, modern, all-steel, truck mounted spudders for shallow information holes to marker limes in Forest City basin. Drillers familiar with formations. Office close to area. Also have spudders for deep wildcat holes. References. J. D. Judd & Son, Martin City, Mo. 6 miles south of Kansas City on Holmes St. Phone Dwight 3273.

For Sale

BENTONITE FOR SALE
Large deposit high grade bentonite located on main line C.B.&Q. R. R. Weston County. Wyoming. This is standard Eastern Wyoming type material, used as Rotary oil and gas well drilling mud, as a bonding and revival agent in foundry sands, meets all requirements for the newly discovered indestructible paper known as alsifilm.
ADDRESS: L. F. Fletcher, Box 155
Moorcroft, Wyo.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgement is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	*$1.05*	*$1.80*	*$2.25*	*$3.30*	*7 Lines*	*$2.45*	*$4.20*	*$5.95*	*$7.70*
4 Lines	*1.40*	*2.40*	*3.40*	*4.40*	*8 Lines*	*2.80*	*4.80*	*6.80*	*8.80*
5 Lines	*1.75*	*3.00*	*4.25*	*5.50*	*9 Lines*	*3.15*	*5.40*	*7.65*	*9.90*
6 Lines	*2.10*	*3.60*	*5.10*	*6.60*	*10 Lines*	*3.50*	*6.00*	*8.50*	*11.00*

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	*1 time*	*$5.00*
1 Inch	*13 times*	*4.50 per inch*
1 Inch	*26 times*	*4.00 per inch*
1 Inch	*52 times*	*3.50 per inch*

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
TULSA, OKLA.

CLASSIFIED ADVERTISING

For Sale—Equipment **For Sale—Equipment** **For Sale—Equipment**

PRESSURE VESSELS

We have recently purchased several pressure vessels, that would make excellent reaction chambers, any type tower or for pressure storage.

We also have SEVEN, 6'x28'x¼" riveted and welded vessels for gasoline storage.

PIPE—STEEL STORAGE TANKS—VALVES and FITTINGS
REFINERY EQUIPMENT

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba,
Riverview at Second, Kansas City, Kansas

Robt. W. Duden,
2100 S. Union, Tulsa, Oklahoma

Exceptional Value!! Motor Rig

2—190 H.P. Waukesha Motors.
1—Jack Shaft Draw Works.
1—6 x 16 Wilson Snyder Pump.
1—200 Ton Roller Bearing Crown Block.
1—200 Ton Roller Bearing Traveling Block.
1—8 inch enclosed rotary hook.
1—20 inch roller bearing table.
1—6" Swivel.
4500 ft.—4½" Grade "D" seamless 16.60 lb. full hole drill pipe.
1—Steel Tool House.
1—4½ x 38' Kelly joint.
1—6¼ x 26' Drill Collar.
1—Steel Tool House.
1—5 K. W. Light Plant.

Other items too numerous to list here. Price complete, $28,500.00. Rig can be seen at the

Melton Supply Co.
Seminole, Okla.

FOR SALE: At our Oklahoma City Warehouse Model D48 Muskogee Iron Works long line well servicing unit powered by HXE Hercules engines mounted on No. 55 truck. I.T.I.O., Bartlesville, Oklahoma.

FOR SALE—Used Refinery Equipment including complete 1000 bbl. Skimming Plant, all size horizontal and vertical tanks of 15,000 bbl. capacity and less. Steam and power pumps, boilers, compressors, valves and fittings. Western Tank & Road Supply Co., Wichita, Kansas.

DISMANTLING REFINERY

Have purchased refinery of Valvoline Oil Co., Warren, Pa. Selling all equipment and land of this huge plant.

WAYLAND RUPERT
Vandergrift Bldg., Pittsburgh, Pa.

CLIMAX R-6-U—125 H. P. Engine, new pistons, rebored, Young Transmission—$1700.00. Butane $150 extra. Address 620 W. Second St., Tulsa, Okla.

FOR SALE at Bartlesville: 1—2A National Drilling Machine, I. T. I. O., Bartlesville, Oklahoma.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO
26 West 2nd St. Cincinnati, Ohio

Always Ready to Help You

You can acquaint thousands of oil men with your particular want or service through an advertisement in this section of The Oil and Gas Journal.

The interested readers respectfully consider the merits of every advertisement in the Classified Columns because they are always in the market for good deals.

Your lease, royalty, production, equipment or service would appeal to some of them.

Mail your advertisement now for next week's issue so that these men can make a deal with you.

CLASSIFIED DEPARTMENT

The Oil and Gas Journal
Tulsa, Oklahoma

For Sale—Equipment

FOR SALE: One complete steam rotary rig with 4" drill pipe, 90 H.P. Broderick Boilers completely equipped and in shape to drill immediately. Located on the Tucker lease out of Haven, Kansas. For further information contact the Viking Drilling Company, c/o Yingling Chevrolet Company, Wichita, Kansas.

FOR SALE—HUGHES J CORE BARREL takes 10 cores, only cored 200' of soft formation, have hard and soft formation heads. Excellent condition. Priced to sell. J. D. JUDD & SONS, Martin City, Missouri.

FOR SALE 45 Star Spudder Complete with tools and equipment, 13 inch down to 6⅝ inch. Also 60 Caterpillar tractor. J. L. Gardenhire, Centralia, Illinois.

FOR SALE at Oklahoma City: 1—13x14 Ajax enclosed type drilling engine, not roller bearing, Babbitted bearings with outboard bearing. I. T. I. O. Co.

FOR quick sale #30 Star Rig Boiler. tools etc. Price $1000.00. Located Mule Creek district Wyoming. WANTED 3500 foot rotary equipment same location. Address G. M. KYLE, Park Ridge, Illinois.

Equipment Wanted

WANTED—Used Hot Oil Pump
60 U. S. Gals. per min. to handle oil at 650° F. and against 800 lbs. per square inch pressure. Diesel or electric motor drive, 3-phase, 220 volt, 60 cycle A. C. With or without Diesel or motor.
Also Potentiometers, flow and temperature recorders and controllers, pressure recorders. Send prices and full particulars to
Northern Engineering Co.
510—9th Avenue East
CALGARY, ALBERTA, CANADA

WOULD be interested in obtaining one used Octane Determination Machine to be C. F. R.-L.-3 method. Address Box J-863, The Oil and Gas Journal, Tulsa, Okla.

Business Opportunities

OFFER undivided one-half interest in fully geologized and approved Rooks County, Kansas structure. Cost of this interest with well contracted to 3,600 ft., $22,000. Write H. C. Petersen, Rt. 2, Berthoud, Colo.

NATURAL GAS: Offers good returns on your investment; shallow drilling. Good market. Low operating expense. Proven territory. H. W. Mitchell, 411 Pacific, Osawatomie, Kansas.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer. Inc., Wilmington, Delaware.

CHARTERS — Delaware best, quickest, cheapest, more liberal. Free forms. Colonial Charter Co., Wilmington, Del.

IF YOU buy or sell royalties, leases or production, DON'T FAIL to check each item listed in these classified columns. They comprise the best medium of exchange available to you.
Classified Department

Bahrein Island Refinery Adding Catalytic Polymerization Plant

The refinery of Bahrein Petroleum Co., Ltd., located on Bahrein Island in the Persian Gulf, will be augmented by the construction of a catalytic polymerization plant, scheduled for completion about August 1, 1939. Designs for this plant and auxiliary equipment are substantially complete, and materials are being ordered. This plant will convert propylene and butylene produced during the cracking and reforming operations into gasoline polymers for use in improving the octane number of the refinery motor gasoline production.

The polymerization will be accomplished by the liquid phosphoric acid catalytic process developed by Standard Oil Co. of California. The operation will be vapor phase with the catalyst chambers operating at about 200 pounds per square inch gauge pressure.

The entire operation, including preparation of the olefin feed cut to be charged to the polymerization unit, will comprise the following steps:

1. Most of the pentane and all of the lighter fractions will be distilled out of the reformed and cracked naphthas in the present stabilizers, condensing as much of this overhead material as is practicable under about 70 pounds pressure. The uncondensed vapors will be compressed and cooled and the combined liquefied light fractions will be delivered to a de-ethanizing column where the ethane and lighter material will be rejected. The bottoms from the de-ethanizer will pass to an olefin still where the butane and propane fractions will be distilled overhead, leaving a heavy bottoms to be returned to untreated naphtha.

2. The condensed propane-butane fractions will then be purified to remove hydrogen sulfide, mercaptans and other impurities, and will then be ready for charging to the polymerization unit.

3. In the polymerization unit, approximately 85 per cent of the total olefins in the feed will be converted to polymers, which, together with the unpolymerized materials, will be condensed.

4. The liquefied mixture from the polymerization unit will be passed through a depropanizer and debutanizer, leaving a butane-free polymer bottoms, which will require rerunning for endpoint control. The rerun motor gasoline polymers will then be ready for blending into the various grades of gasoline.

The polymerization plant, together with the pretreating, after stabilizing and auxiliary equipment, will have adequate capacity to handle the production from the two Dubbs cracking units and the one Dubbs reformer when all three units are operating to capacity. The design and construction of the new plant are being handled by the engineering department of the Standard Oil Co. of California. Construction of the polymerization unit and auxiliary equipment will involve an expenditure in excess of $1,000,000.

Index to Advertisers

A

Abercrombie, J. S., Co.
Abercrombie Pump Co.
Air Reduction Sales Co. 1
Ajax Iron Works
Alco Products Division — American Locomotive Company
Allis-Chalmers Mfg. Co.
Allsteel Products Mfg. Co., The
American Bosch Corporation
American Cable Division of American Chain & Cable Co., Inc.
American Cast Iron Pipe Company
American Iron & Machine Works
American Meter Company
American Sand-Banum Co., The 95
American Steel & Wire Company
Armstrong Machine Works 86
Atlas Drop Forge Co. 94
Atlas Imperial Diesel Engine Co. 17
Atlas Supply Co.
Auer, C. L., & W. W.
Axelson Manufacturing Company 57

B

Baash-Ross Tool Company 87
Babcock & Wilcox Tube Co., The
Badger & Sons Co., E. B.
Bakelite Corporation
Baker Oil Tools, Inc.
Baldwin-Duckworth Chain Corp.
Bantam Bearings Corp.
Baroid Sales Company
Barret, William M., Inc. 95
Bastian-Blessing Co., The
Beaumont Iron Works Co.
Beckman, Inc.
Bethlehem Steel Co.
Billings & Spencer Co., The 95
Boston Woven Hose & Rubber Co.
Braden Steel Corporation 78
Bradford Motor Works, Inc.
Brewster Company, The 87
Bridgeport Machine Company 85
Broderick & Bascom Rope Co. 12
Brown Instrument Co., The
Bruning, Charles, Co., Inc. 11
Buckeye Traction Ditcher Co., The
Butler Manufacturing Co.
Byron Jackson Co.

C

Cable, Jo H. 106
Cameron Iron Works, Inc.
Carey Company, The Philip
Carnegie-Illinois Steel Corporation
Case, J. I., Company
Cast Iron Pipe Research Association, The 55
Caterpillar Tractor Co.
Chain Belt Co., The
Chapin-Fulton Mfg. Co., The 90
Chapman Valve Mfg. Co., The
Chemical Process Co., Inc., The
Chevrolet Motors Division, General Motors Sales Corporation
Chicago Bridge & Iron Company 77
Chiksan Oil Tool Co., Ltd.
Clark Brothers Company
Classified Advertising 126-127
Cleveland Trencher Company
Climax-Molybdenum Company
Columbia Steel Company
Columbian Steel Tank Co.
Continental National Bank of Fort Worth
Continental-Falk 63
Continental Oil Co.
Continental Supply Company, The 63
Cooper, Fred E.
Cooper-Bessemer Corp., The
Core Laboratories, Inc.
Crane Co. 7
Cummins Engine Co.
Curtin, W. H., & Co., The

D

Darling Valve & Mfg. Co. 94
Davis Regulator Co.
Dayton Rubber Mfg. Co., The
Diamond Chain & Manufacturing
Dodge Mfg. Company 82
Dohery Stone Drill Co. Front Cover
Dowell, Incorporated
Dragon Mfg. Co., The
Dresser Mfg. Co. 71
Du Pont de Nemours & Co., Inc.

E

Eagle Picher Lead Co.
Eastman Oil Well Survey Co.
Economy Electric Lantern Co. 98
Edward Valve & Mfg. Co., The
Emsco Derrick & Equipment Company
Ensign Carburetor Company, Ltd.
Ethyl Gasoline Corporation 8-9
Evansville Chamber of Commerce

F

Failing, George E., Supply Company
Filtrol Corp. 67
First National Bank of Fort Worth
First National Bank in Houston
First National Bank & Trust Co. of Tulsa, The
Fisher Governor Company
Fluor Corporation, Ltd., The
Foote Bros. Gear and Machine Corporation
Ford Motor Co.
Fort Worth Chamber of Commerce
Fort Worth Clearing House Association
Fort Worth National Bank, The
Foster Wheeler Corp.
Four Wheel Drive Auto Co., The
Foxboro Co., The
Franks Mfg. Co.
Frick-Reid Supply Corporation
Frost National Bank

G

Gardner-Denver Company
Garlock Packing Company, The 98
Gaso Pump & Burner Mfg. Co.
Gasoline Products Co., The
Gates Rubber Co., The 14
Gatke Corporation
General American Transportation Corporation—Terminal Division
General Electric Company
General Motors Truck
General Paint Corporation
General Power, Inc.
Geophysical Service, Inc.
Gilmer Company, L. H. 2
Gilmore Wire Rope Division of Jones & Laughlin Steel Corporation
Girdler Corporation, The
Goodall Rubber Co.
Goodrich Co., B. F., The 3
Goodyear
Gott, H. P., Mfg. Co. 82
Goulds Pumps, Inc.
Graver Tank & Mfg. Co., Inc.
Gray Processes Corporation, The
Grossrohr-Verband G.m.b.H.
Guiberson Corporation 72
Gulf Oil Corp.
Gulf States Utilities Co.
Gustin-Bacon Mfg. Co.

H

Haering, D. W., & Co., Inc. 90
Halliburton Oil Well Cementing Co.
Hanlon-Buchanan, Inc.
Happy Belting Company
Harnischfeger Corporation
Harrisburg Steel Corporation
Hazard Wire Rope Division of American Chain & Cable Co., Inc. Inside Back Cover
Hercules Tool Company
Hewitt Rubber Corp.
Hill-Hubbell & Co.
Hoard Exploration Company
Houston Lighting and Power Company
Hughes Tool Co. Back Cover-52-53
Humble Oil & Refining Co.
Hunt Tool Company
Hydril Co. Front Cover

I

Independent Exploration Company
Ingersoll-Rand Co.
International Derrick & Equipment Co., The
International Geophysics, Inc.
International Harvester Co.
International Nickel Company, Inc., The 18
International Petroleum Exposition

J

Jarecki Manufacturing Company
Jensen Brothers Manufacturing Co.
Jerguson Gage & Valve Co.
Johns-Manville Corporation
Johnston, M. O., Oil Field Service
Jones & Brooks, Inc.
Jones Company, S. M.
Jones & Laughlin Steel Corporation Inside Front Cover

K

Kane Boiler Works, Inc.
Kellogg, M. W., Company, The 6
Kennedy Valve Mfg. Co., The 105
Kerotest Manufacturing Co.
Keuffel & Esser Co. 81
Key Company
Keystone Driller Co.
Kibele Manufacturing Co.
Kinley Co., M. M.
Kinzbach Tool Co. 87
Kobe, Incorporated
Kropp Forge Company
Krupp

L

Landis Machine Co., The
Lane-Wells Co., The
Larkin Packer Company, Inc.
Layne & Bowler, Inc.
Leland Equipment Co.
Lennox Hotel
Le Roi Company
Leschen, A., Sons Rope Co.
Lincoln Electric Company, The
Linde Air Products Co., The
Line Scale Co., Inc.
Link-Belt Company
Lockheed Aircraft Corporation
Lone Star Cement Corporation
Lucey Products Corporation
Ludlow Valve & Mfg. Co., The
Lufkin Foundry & Machine Co.
Lufkin Rule Co., The 98
Lummus Co., The
Lunkenheimer Co., The

Mc

McGregor Working Barrel Company
McKissick Products Corp.

M

MacClatchie Manufacturing Company
Macwhyte Co.
Magnolia Airco Gas Products Co. 1
Maloney Tank Mfg. Co.
Manhattan Rubber Mfg. Division
Mannesmannrohren Werke
Marley Company, The
Marmon-Herrington Co., Inc. 89
Marsh, James P., Corp.
Martin-Decker Corp.
Maschinenfabrik Imperial G.m.b.H.
Mathey Machine Works, C. A.
Mauser, K.-G.
May, George S., Company
Mayfair Hotel 98
Medart Company
Meehanite Research Institute
Merco Nordstrom Valve Co.
Metric Metal Works
Midco Tool & Supply Co.
Mid-Continent Supply Co.
Midwest Piping & Supply Company, Inc., The
Miller Sand Pump Co., The 91
Mission Mfg. Co., The 60
Monsanto Chemical Company
Murcell, Inc., U. C.
Murphy Diesel Company Ltd.
Muskogee Iron Works

N

National Bank of Tulsa
National Carbon Co., Inc.
National Supply Co., The 97
National Transit Pump and Machine Co.
National Tube Co.
Naylor Pipe Company
New Bedford Cordage
New Deal Specialty Co., The
Newman, Hender & Co., Ltd.
Novo Engine Co.

O

O'Bannon Co., Walter
Oil Center Tool Co. 86
O.C.S. Mfg. Co., The
Oil Equipment Manufacturing Co.
Oil Industry Mailing List Co.
Oil Well Mfg. Corp.
Oil Well Supply Company 93
Oil-World Exposition, Inc.
O.K. Machine & Manufacturing Co.
Osage Metal Company
Oster Manufacturing Company
Otis Pressure Control, Inc.

P

Page Steel & Wire Division of American Chain & Cable Co.
Parkersburg Rig & Reel Co., The
Parkhill-Wade
Patterson-Ballagh Corporation
Peerless Pump Division of Food Machinery Corp.
Penberthy Injector Co. 47
Pennsylvania Grade Crude Oil Association
Perco, Inc. 20
Petroleum Advisers, Inc.
Petroleum Electric Power Club 66
Petroleum Publishing Company, The 15
Petroleum Rectifying Company
Philadelphia Gear Works
Pittsburgh-Des Moines Steel Company
Pittsburgh Equitable Meter Co.
Pittsburgh Steel Company
Plymouth Cordage Co.
Pomona Pump Co.
Portable Rig Co.
Prest Machine Works Co.
Price Co., H. C.
Pritchard, J. F., & Co.
Pure Oil Co.

R

Reading-Pratt & Cady Division of American Chain & Cable Co., Inc.
Rector Well Equipment Co., Inc. 106
Reda Pump Co.
Reed Roller Bit Company 58
Regan Forge & Engineering Co.
Reilly Tar & Chemical Corporation
Republic Rubber Division of Lee Rubber & Tire Corp.
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.

S

St. Joseph Forward Association
San Antonio, City of
Schlumberger Well Surveying Corporation
Security Engineering Co.
Seismograph Service Corp.
Shafer Bearing Corporation
Shaffer Specialty Co., The
Shaffer Tool Works
Shand & Jurs Co. 13
Shell
S.K.F. Industries, Inc.
Skinner Co., M. B.
Smith, A. O., Corporation 4-5
Smith Company, E. M.
Smith, H. C., Oil Tool Co. 87
Smith Company, Howard 86
Smooth-On Mfg. Co.
Socony-Vacuum Oil Co.
South Chester Tube Co.
Southwestern Gas & Electric Company
Spang Chalfant, Inc.
Spang & Company, Inc.
Sperry-Sun Well Surveying Co.
Spicer Mfg. Corp. 68
Standard Brake Lining Co. 86
Star Drilling Machine Company
Stark, Ralph, Inc.
Stearns-Roger Manufacturing Co.
Sterling Engine Co.
Sturtevant Company, B. F.
Subterrex
Swartz, Stephen

T

Taylor Forge & Pipe Works
Taylor Instrument Companies
Technical Oil Tool Corporation 86
Texaco Development Corporation
Texas Iron Works
Thornhill-Craver Co., Inc.
Timken-Detroit Axle Co.
Timken Roller Bearing Company
Timken Roller Bearing Company Steel and Tube Division 16
Toledo Pipe Threading Machine Co., The 105
Tretolite Co.
Trinity Portland Cement Company
Tube Turns, Inc.
Tulsa Boiler & Machinery Co.
Tulsa Chamber of Commerce
Twin Disc Clutch Co.

U

Union Wire Rope Corporation
Unit Rig & Equipment Company
United Motors Service, Inc.
United States Rubber Company
United States Steel Corp., Subsidiaries
United States Steel Products Company
Universal Atlas Cement Co.
Universal Exploration Co.
Universal Oil Products Co. 51

V

Vagabond Coach Mfg. Co.
Viking Pump Co.
Visco Products Company
Vogt, Henry, Machine Co.

W

Wall Rope Works, Inc. 86
Walworth Company
Warren Petroleum Corporation
Watson-Stillman Co., The
Waukesha Motor Co.
Well Equipment Mfg. Corp.
Westinghouse Electric & Mfg. Co.
Wheatley Bros.
Wheland Co., The
Whitney Chain & Mfg. Co., The 10
Wickwire Spencer Steel Company 49
Williams & Co., J. H.
Wilson Manufacturing Co.
Wilson Welder & Metals Co., Inc.
Witte Engine Works
W-K-M Company, Inc.
Worthington Pump & Machinery Corporation
Wyatt Metal & Boiler Works

Y

Young Engine Corp.
Young Radiator Company
Youngstown Sheet & Tube Co.

Z

Zink Burners, John

The Oil Man's Calendar appears on Page 40